EDITORIAL

DOMESTIC ENGINEERING

Whole No. 1494 CHICAGO, JULY 30, 1921 Vol. 96, No. 5

SEEING THINGS AS THEY REALLY ARE.

PROGRESS ceases for a man when he reaches the point where he is no longer willing to accept facts and ideas from others. The man who has reached the decision that there is no business to be had and refuses to look at it in any other light is not far from right, as far as he is concerned, for by taking this stand and closing his eyes to the true conditions, he is not mentally prepared to cope with conditions as he now finds them. Believing that people are unwilling to buy under any circumstances, he is not taking the necessary steps to find out just what things people really need and are willing to buy, nor does he plan how to present these things to them in the most effective manner.

Such a man fails to realize that all must still have food, clothing, shelter, heat, and the thousands of other things that are absolutely indispensable in our complex modern life. The trouble with men of this type is that they were carried away with the spirit of ease and recklessness prevailing during unusual prosperity, not realizing that in such periods people are just consuming a surplus of energy and material gathered over a number of years. During these times people consume more than they produce and must eventually go back to the same old policies of hard work, thrift and simple habits.

People are buying, but they are not buying so recklessly nor such expensive goods. They must practice economy, which means that they must purchase those things which best answer their needs and at the same time represent the greatest return for the money invested. That firm, which because of general business efficiency can furnish a high quality of goods at a fair margin of profit, can do business and is doing business at the present time. That there is business to be had is shown by the fact that there are quite a number of firms which are running 100 per cent, as shown by the "Chicago Tribune," which started the year with the slogan, "1921 Will Reward Fighters." To prove their contentions, they have been showing how various companies have succeeded not only in holding their business up to normal, but also in many cases in greatly increasing it.

The men who are responsible for the success of these firms are not sitting around with the charter members of the "Business is Rotten" Society predicting ruin for the country. They refuse to be influenced by the calamity howlers, but they insist on looking the situation square in the face and seeing things as they really are, for they realize that they must remain open-minded and get all the facts before they can solve any problem. Having decided what people will buy and what they are willing to pay, they go about to furnish it. In so doing they are not only doing a profitable business at the present time, but are placing themselves in the best position to take full advantage of the business revival which slowly but surely follows every period of depression.

Study your own field and find out what is needed most and then furnish it in the most efficient manner possible. Advertise, let people know what you have done and are doing. People are reading the advertisements more carefully now than ever before. They must buy, but they are buying where they get the most for their money in quality, quantity and service.

BUILD UP YOUR MAILING LIST.

A GOOD mailing list circularized regularly can be the means of developing a great deal of profitable business for the plumbing and heating contractor. There are several good ways to build up such a list, and a very effective one is that used recently by a retail hardware dealer. He distributed a large number of prospect cards among school children and offered them a small sum for each card that they returned properly filled out with the names and addresses of neighbors and friends, who might be interested in certain specific articles on which the dealer was conducting an aggressive selling campaign. Letters to the people whose names were gotten in this manner resulted in a great many profitable sales. They also brought in new customers and furnished valuable additions to the dealer's mailing list.

DON'T NEGLECT THE FARMER.

The farmer represents about one-half of the buying power of this country. He will soon be marketing his crops. What are you doing to encourage him to spend part of his crop money with you? Now is the time to get him to plan for a water supply system, heating plant, modern plumbing fixtures, or anything else in plumbing or heating.

A $65,000 PLUMBING *and* HEATING INSTALLATION *in* MILLIONAIRE'S HOME

Home of Congressman Allen F. Moore at Monticello, Ill.

Estate of Congressman Allen F. Moore Has Mansion Equipped with Fine Plumbing and Direct Modulation System of Heating—Plumbing Includes Outdoor Swimming Pool and Piping System for Private 9-Hole Golf Course

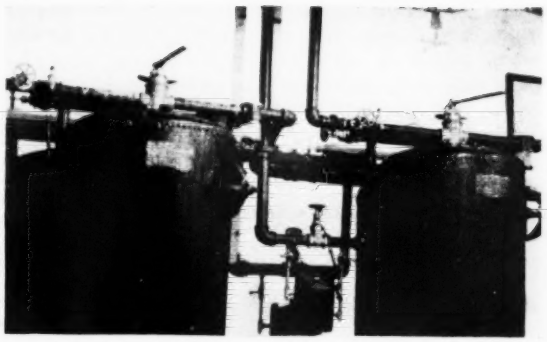
THE "Inquiring Reporter" of a large Middle Western newspaper recently stopped five men and women on the street and asked them what they would do if they had a million dollars. The majority said the first thing they would do would be to build a home. If these five people ever reach the coveted million they can get some fine ideas on home building and equipment by going to Monticello, Ill., to see the new home of Congressman Allen F. Moore. This beautiful estate stands as a remarkable example of what may unquestionably be considered the last word in modern plumbing and heating equipment. The work was installed by contractors acknowledged leaders in their respective lines, the plumbing being equipped by William J. Lang of Chicago, past president of the local and state master plumbers' associations, and the heating work by E. J. Claffey, also of Chicago, past president of the local heating contractors' organization. The plumbing work cost $40,000 and the heating equipment approximately $25,000.

Rarely is plumbing work more comprehensive than in this instance. The estate is located on the fringe of Monticello, but fortunately close enough so that city water and sewers could be utilized. The home contains seven fine bathrooms, three washrooms with lavatories and toilets, separate filteration systems for hard and soft water, fire lines, and a vacuum cleaning system. Plumbing work outside the house included an 80,000 gal. swimming pool, construction of a large soft water cistern under the terrace, piping system for sprinkling a private 9-hole golf course, water supply to and drainage from a lake, construction of tennis back-stops, supplying water to a lily pond and several ornamental fountains, and even the erection of a 70 ft. flagpole, made of pipe.

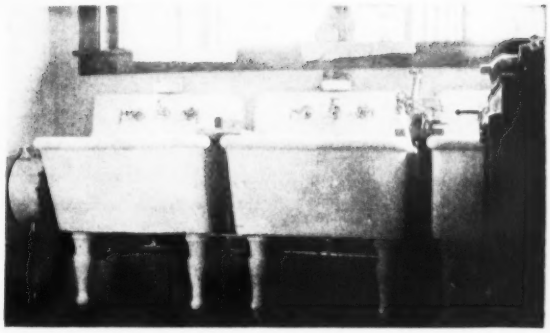
Invaluable service has also been rendered in the preparation of the chart shown in an accompanying illustration, which is a key to the entire plumbing system. A copy of this is framed and hung in the machine room in the basement of the mansion, and makes the system foolproof. This precaution is a feature of the service given by Mr. Lang on all important plumbing installations. He states that times out of number these charts have enabled the owner to remedy different troubles in quick time, with safety and satisfaction. The fact that this estate is located on the fringe of a small town makes it readily apparent why this chart is really essential.

The house is located approximately 450 ft. from the city sewer, from which point an 8-inch vitrified tile line is run to the building line. The house is circled with a 6-inch vitrified sanitary sewer which takes care of all waste and soil lines from the house proper. Copper downspouts empty into cistern located under the terrace on the north side of the building. This cistern is 27 ft. long, 17 ft. deep and 14 ft. wide. The rain water is filtered three times through filtering beds before entering the pressure system which pumps it through the house. Another filtration process also takes place after the soft water leaves the pressure system. There is also a charcoal bag in the cistern through which the water passes to remove odors.

The pressure system is electrically driven, having a capacity of 2,000 gal. per hour. The steel storage tank is 4 ft. in diameter and 10 ft. long, holding 940 gals. The plant has a 3-inch suction and 2-inch discharge, and serves all fixtures hot and cold throughout the house except drinking fountains and toilets. One-inch risers are made in each instance, with branch connections varying according to the type of fixture served.



Filters for Purifying the Hard Water.



Porcelain Sinks in the Laundry.

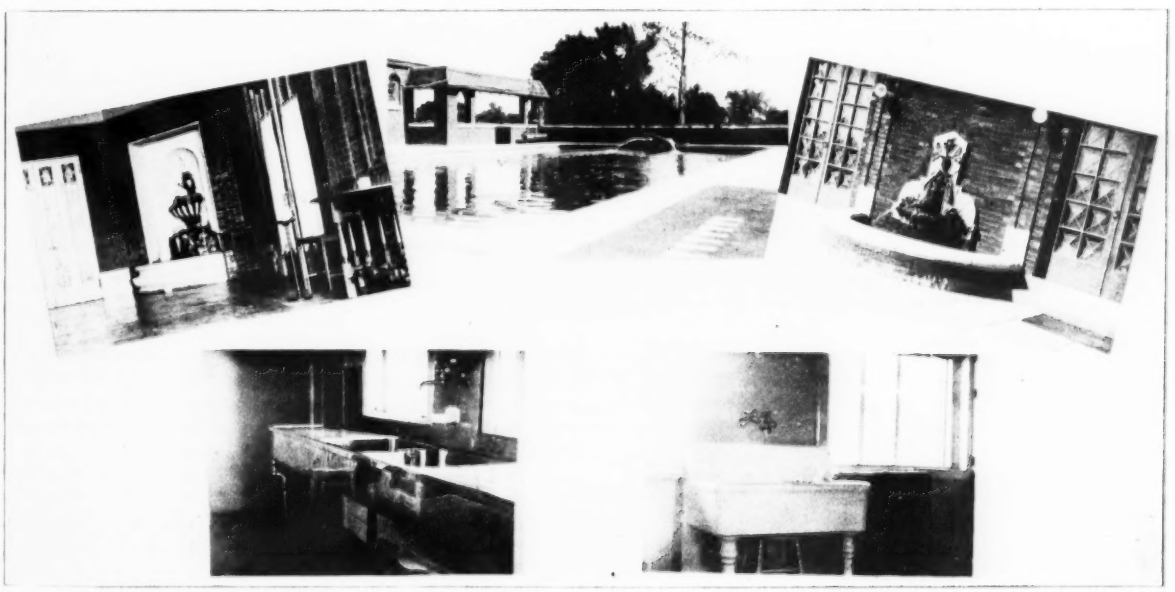
A separate filtration system is also provided for hard water, to remove impurities, such as iron, etc.

The pressure system is by-passed to supply either rain water or city water, and in case the reservoir runs dry, the system can be readily switched over to supply city water. A 3-inch water main is taken off the city main and reduced to 2 inches to serve the house.

The plumbing system is arranged in the most sanitary manner, having vents, revents and local vents. All stacks are 4 inches, extending 5 inches through the roof, with lead flashing. Vents are 2 inches and 1½ inches.

Solid porcelain fixtures are installed in bathrooms, all trimmings being either black or white or German white metal, no nickel plated brass being used. Enclosed shower with glass doors are to be found in each bathroom, and three bathrooms contain bidets. All showers and bidets and some bathtubs are equipped with thermostatic mixing valves which automatically regulate the water at any predetermined temperature. The owner's bathroom contains an unusually large bathtub, known as the "Taft" for the reason that it was especially designed for the ex-president. It measures 6 ft. 6 inches long, 40 inches wide, with the usual depth. Another feature of certain bathrooms is the installation of built-in scales, which are recessed in the wall and are flush with the floor. The dressing rooms of the owner and his wife are also equipped with toilet fixtures. All bathrooms have a recessed drinking fountain over the bathtub, each fountain having a ⅜-inch supply and ¾-inch waste. Closet combinations are all white throughout, supplies being made through the back of the tank. Bathtubs are of the built-in type. All bathroom supplies are separately valved, each valve being numbered. Four slop sinks are installed in the house. The butler's pantry contains a 12-ft. double drainboard, double compartment German silver sink, as shown in an accompanying illustration. The kitchen has a porcelain sink with double drainboard and a vegetable sink. These three fixtures are equipped with single swinging faucets, which will be noted in the illustration, together with the different porcelain hooks and towel bars adjacent to the fixtures.

The vacuum cleaner illustrated herewith is installed in the machine room, which also contains the pneumatic water system and hard water filtration plant. The vacuum outfit has a 2-inch main and seven 1½-inch risers, with a total of 14 plugs or outlets. Close examination of this illustration will show the use of clamped rubber connections on the intake and exhaust, while the cleaner rests on layers of cork above the concrete floor. This has been done to prevent noise and vibration going



Some Attractive Views of the Home of Congressman Moore at Monticello, Ill. Top, left and right: Ornamental Fountains in the Atrium and on the Terrace; Center, top: The Outdoor Swimming Pool, with Special Concave Overflow Having 14 Outlets which Keep the Top of the Water Clean. Bottom, the German Silver Sink in the Butler's Pantry and the Porcelain Vegetable Sink in the Kitchen.

to the upper floors. Rubber clamped connections are also used on the pressure system, both intake and supply to house, to prevent the noise travelling through residence. The hose used is railroad air brake line, which will withstand a pressure of 200 lbs.

The swimming pool illustrated herewith has a capacity of 80,000 gallons, having dimensions: 65 ft. long, 30 ft. wide, with depths ranging from 3 ft. 6 inches to 10 ft. It is supplied by water forces such matter into the overflow, thus keeping the top of the water entirely fresh at all times. The overflow has 14 outlets.

The golf course is watered by a 3-inch supply direct from the city main, and controlling basins are provided in three parts of the grounds so that the south, west and north portions of the course can be shut off individually without interfering with the rest of the system, about 1½ miles of pipe being used. All

ALLEN F. MOORE RESIDENCE, MONTICELLO, ILL.

Fixtures.	Valves. Cold City	Cold Rain	Hot Rain	Circ.	Location.
Main City Cold Water for All Fixtures	35	....	....	....	Machine Room
Main Hot Water for All Fixtures	....	27	....	....	Boiler Room
Main Rain Water for All Fixtures	....	2	....	....	Machine Room
Mr. and Mrs. Moore's Bath and Dressing Rooms	13	14	15	16	S. E. Store Room
Mr. Bradford's Bath Room	11	10	8	9	Tool and Work Room
Mr. Billo's Bath Room	21	24	22	23	Boiler Room
Guest-Bath Room, North	4	5	7	6	Trunk Room
Guest Bath Room, South	20	17	19	18	Large Coal Room
Servants' Bath Room, 2nd Floor	41	40	39	38	Vegetable Room
Slop Sink, 2nd Floor, East	....	17	19	18	Large Coal Room
Slop Sink, 2nd Floor, West	....	40	39	38	Vegetable Room
Ladies' Wash Room, 1st Floor	11	10	8	9	Tool and Work Room
Men's Wash Room, 1st Floor	20	17	19	18	Large Coal Room
Servants' Wash Room, 1st Floor	45	42	43	44	Vegetable Room
Kitchen Vegetable Sink	36	....	37	....	Basement Humidor
Kitchen Sink	33	....	32	....	Rear Basement Hall
Service Pantry Sink	30	....	31	....	Basement Humidor
Fountain in Atrium	29	....	....	....	Closet Off Bowling Alley
Fountain on Terrace	12	....	....	....	Tool and Work Room
Sink, Cold Storage Room	36	....	37	....	Basement Humidor
Sink, Boiler Room	25	....	26	....	Boiler Room
Fire Line	27	....	....	....	Boiler Room
Rain Water From Cistern	....	34	....	....	Machine Room
Drain and Shutoff for Garage	....	46	47	....	Under Rear Basement Stairs
Drain and Shutoff for Golf Shelter	....	48	49	....	Under Rear Basement Stairs
Laundry Trays	52	51	50	....	R. Side of Laundry Trays
Main Shutoff for Garage Above Ground	53	....	....	....	Laundry
Main Shutoff for Garage Under Ground	54	....	....	....	Laundry
Golf Shelter	55	....	....	....	S. Tool Room of Golf Shelter
Green Houses and Gardener's Cottage	58	....	....	....	Basin Auto Entr. to House
Lawn Sprinklers, South	58	....	....	....	Basin Auto Entr. to House
Golf Course Lawn Sprinklers	59	....	....	....	Basin Back of Spring Board
Fire Line to Attic Only	60	....	....	....	E. Slop Sink Room, 2nd Fl.

Valve No. 1, Rain Water By-pass, always to be closed.
Valve No. 3, City Water By-pass for Filters, always to be closed.
Valves No. 2 and 1: If cistern runs dry close Valve No. 2, open Valve No. 1 for City Water.
Valves No. 3, 56 and 57: If Filters go wrong open Valve No. 3 and close Valves No. 56 and 57. Clean Filter twice each week.
Valve to regulate Fountain in Atrium, panel at stairs to basement, rear of fountain.

In Cold Weather.

Drain Fountain on Terrace; close Valve No. 12; open petcock at valve in Game Room.
Drain Sillcock in Garage Court; close valve in Laundry; open pet and sill cocks.
Drain City Water to Golf Shelter; in S. Tool Room of Golf Shelter, Valve No. 55.
Drain hot and cold rainwater to Golf Shelter; close Valves No. 48 and 49; open petcocks.
Drain all pipes and traps in Golf Shelter; Notice drain on mixing valves of showers.
Shut off supply to turtles at pool; valve in basin back of springboard.
Shut off check and waste to Lily Pond and drain pond.
Shut off check and waste to Fountain, lower garden.
Notice! Renew charcoal in cistern every three months.

W. J. Lang, Sanitary Engineer, Chicago, Ill.

Chart Prepared by Plumbing Contractor which Enables the Owner to Operate System Intelligently in Case of Emergency.

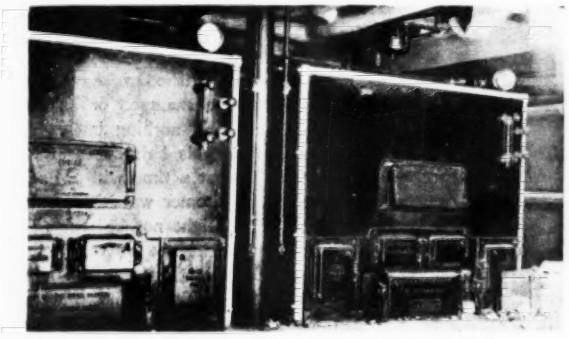
filtered hard water which enters from two turtles on either side of the springboard. The pool has a 3-inch rain supply and a 6-inch iron waste which discharge to a lake on the estate. The manner in which the overflow is constructed is worthy of special comment and is said by the plumbing contractor to be the most practical for an outdoor swimming pool. The overflow is made concave and laid level around the entire pool, so that all dust, leaves, and other settlement on the surface of the water is continually removed, as the continuous supply of fresh

piping is laid 4½ ft. below ground to prevent freezing. There are approximately 75 sprinklers throughout the grounds. Pipe sizes vary from the largest size of 3 inches to 1 inch at the extreme points of the course, every part of which is made accessible for sprinkling purposes.

The lake has a 3-inch supply to replenish the supply in case of a dry season. Normally the lake is filled from a 24-inch vitrified drain tile from surrounding farms. The outlet from the lake goes over an 8-ft. artificial rock dam, which empties into a

culvert, while the lake may be drained, if necessary, by a 12-inch gate valve.

The plumbing also included water supplies to ornamental drinking fountains in the atrium and on the terrace, both of which are illustrated herewith, as well as a lily pond in the upper garden and a fountain on a lower terrace. A fire hose system is also provided, having 2-inch supplies to the attic, four extensions all told being taken off for hose connections. The

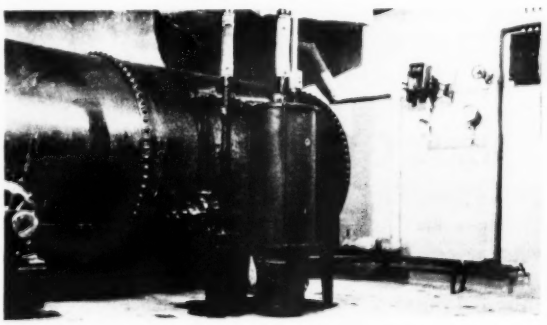


A View of the Boiler Room.

70-ft. flagpole in the front lawn is erected of 2½ to 6-inch pipe, set in a base of 5½ sq. ft. of concrete.

Two tennis backstops are built of 1½-inch pipe. Each backstop is 56 ft. long and 15 ft. wide, utilizing about 750 ft. of pipe, all of which was cut and threaded on the job. Connecting of a 1½-inch waste and ¾-inch supply to the ice machine; and a ¾-inch supply to the washing machine in the laundry was also part of the plumbing work.

Hot and cold water piping throughout the house, including that in partitions and under floors, is covered with asbestos. Hot water is supplied by a garbage burner having a capacity of 800 gallons and a storage tank of 800 gallons capacity.



A Partial View of the Pneumatic Water Supply and the Vacuum Cleaning Outfit.

One of the accompanying illustrations shows the two steam boilers with metallic jackets which heat the house and the adjacent garage, the latter also having chauffeur's quarters on the second floor. These buildings are heated with a Modulation system of steam heating of the direct type excepting the atrium and the grand stair which are heated by the indirect type, and a special feature is that no radiators are visible above the basement throughout the mansion so as not to conflict in any way with the decorations of the different rooms. There is approximately 5,000 sq. ft. of radiation and radiators are concealed behind grills and recessed under the windows, flush with the wall.

Grills are provided both at the bast and top of the radiator.

All radiators have extended stem modulation valves arranged in such manner that the dial of the valve is the only exposed portion of the radiator valve operating mechanism.

The grand stair is heated by two indirect stacks of 120 sq. ft. each of pin radiation, encased in sheet metal and hung from basement ceiling. The air outlets are provided with 18x24-inch registers in the wall under the stairs.

Two indirect stacks of 90 sq. ft. each are used to heat the atrium, the registers of which are 16x20 inches in size and placed in the wall near the curved bay window.

Radiation is figured on a heat loss basis for a temperature of 70 degrees when the outside conditions are 10 below zero. Heat emission factors for exposed radiators are 250 B.t.u. and concealed radiators 200 B.t.u. Supply piping is based on a ¼-lb. drop in pressure.

All steam supply and return risers are concealed throughout in wall chases and partitions, and the run-outs concealed under the floors.

The steam lines are dripped into a separate wet drip line. There are no air valves on the radiators, the venting being done at one central point at the vent trap in the boiler room. All water of condensation is returned to the boilers by gravity. The plant is operated normally at an operating pressure of 8 oz., but with the system as designed may be operated at 2 or 3 lb. above atmosphere or even below atmospheric pressure if desired. Circulation is maintained for hours with 5 or 6 inches of vacuum on the system after the air is once expelled. No pumps are therefore necessary. The garage and caretaker's house, 200 ft. distant, are heated from the main house plant by an overhead main which is taken off the header in the boiler room and run to a point on the first floor and carried over a covered passageway between the rafters of same to the garage. All piping throughout is covered with asbestos.

The volume of business, as measured by debits to individual accounts reported to the Federal Reserve Board for banks in 153 important clearing house centers, declined from $7,579,000,000 for the week ended July 6 to $7,319,000,000 for the week ended July 13, a reduction of $260,000,000, or about 3.6 per cent, in spite of the fact that the earlier week contained only five business days.

The remarkable expansion of automobile manufacture in the past six years is demonstrated by the fact that the combined working capital of eight companies was $270,240,789 December 31, 1920, an increase of nearly $200,000,000 over December 31, 1914. Aggregate inventories totaled $218,267,712, or nearly $160,000,000 more than six years previously.

The week ended July 12th showed a big gain in employment among the seventy-nine members of Employers' Association of Detroit. There were 113,131 men on the payroll, or 4,333 more than the previous week. However, there is a less pleasant side to the figures. There were 14,782 workers on part time, against only 9,251 the week before. Number of full time workers was 98,349, or 1,198 less than week before.

Why He Turned Out of the Road.

"Why do you turn out for every road hog that comes along?" said the missus, rather crossly. "The right of way is ours, isn't it?"

"Oh, undoubtedly!" answered he calmly. "As for our turning out, the reason is plainly suggested in this epitaph which appeared in a newspaper recently:

"Here lies the body of William Jay,
Who died maintaining his right of way;
He was right, dead right, as he sped along,
But he's just as dead as if he'd been wrong."

—Boston Transcript.

The Art of Salesmanship—What It Is

By A. H. French.

What is salesmanship?

Noah Webster tells us that a salesman is "one whose occupation is to sell goods or merchandise."

Too often we construe this to mean selling by personal contact; that the man who is the best talker is necessarily the best salesman.

Ability to talk and extol the merits of the article which one desires to sell is important but oftentimes the ground work for the sale is laid long before; many times sales are made without a word to the customer.

The Florist.

A florist in a suburban town had long been famous among the townspeople for the pansy plants which he raised and sold each spring. He had no difficulty in reaching his fellow citizens for they all purchased their flowers from him, but his business was mostly confined to the little town. One year he transferred his pansy bed to a garden close beside the railroad track. Commuters passing through the town admired the bright colors and the attractive display and soon customers began to come to the florist from many surrounding towns. *That was salesmanship.*

The Grocer.

A big concern with a chain of grocery stores in many cities and towns throughout the country has a rule requiring that the show windows in all its stores shall be cleaned out and redressed once each week. In some of the smaller towns the managers look upon the rule as a hardship, saying once a fortnight, or even once a month would be often enough; that people trade at the store any way because of its cut prices or because there is no other convenient store; and that the stock of such a store offers very little opportunity for attractive window displays. But the company insists on its rule. *It is salesmanship.*

The Undertaker.

An undertaker started business in a small city. He was a stranger and there were other old established undertakers in town and as a result business was slow about coming his way. One night he hitched up his horse to the black undertaker's wagon and drove away hurriedly passing through several residential streets at a good clip but not so fast but that persons sitting on their front porches or in the windows could read the name on the wagon and wonder who had died. Another night he drove to a different section of the city. In time his wagon became a familiar sight on the street and it was not long before he was responding to professional calls. He had sold his services without even knowing his prospective customers. *That was salesmanship.*

The Plumber.

A plumber had been in business for a long time. Everybody in town knew him and called him "Jim." Business was "fair," but he had plenty of time on his hands. One day he decided to wash the windows. The improvement spurred him on and he replaced the few elbows and other fittings and other small articles which had long lain there gathering dust, with a porcelain bathtub and other attractive fixtures. Then he looked around the store for further possible improvements and picked up several lengths of soil pipe which customers had been stepping over and rearranged the fixtures to give a more attractive look to the place. That evening he noticed that the lights in his windows were not as bright as those of other tradesmen and so he installed larger electric bulbs. The fever still remained with him and the next day he washed his auto truck which heretofore he had considered looked "good enough for a plumber." Finally, he decided to make his advertising more attractive and instead of running a brief card in the local weekly announcing that "James Jones, Practical Plumber, was located at 13 Main Street" he spent half an hour each week composing something new for the space. Gradually business improved and instead of being "fair" was "good" and getting better all the time. *He had become a salesman instead of merely a plumber.*

The Barber.

A man went into a barber shop in Boston. He had been "pestered most to death" by barbers who invariably wanted to sell him a hair cut, a shampoo, a facial massage, a hair singe or an application of hair tonic. As he took his seat in the chair he informed this barber that he wished a shave and added abruptly that he didn't care for a shampoo or any of the other several extras. The barber said nothing but as he stood behind the customer after combing his hair he carefully picked several hairs from the comb one at a time with a quiet deliberation which did not escape the customer watching in the mirror. The customer wondered if it might not be true that his hair was getting thin and if it might not be that other barbers in trying to sell him hair tonic might not really have been doing him a favor. He spoke to the barber and the latter agreed the hair was coming out pretty fast and suggested a tonic which would prevent it. He made a sale. *That was salesmanship.*

Good Plumbing An Investment.

A great deal is said in advertising about the comforts of modern plumbing and heating, but there is a reminder in the accompanying advertisement that an up-to-date bathroom and kitchen have other advantages. They add to the value of the home. This was definitely proven recently when a plumbing and heating contractor succeeded in increasing a

New Plumbing

Fixtures in the Bath Room and Kitchen would add 25% to the value of your house

Get our estimate

E. E. GUION & SON

Plumbing — Heating — Roofing

Phone 2844 15 South Sixth Avenue, Mount Vernon

loan to the extent of $1,500 by an investment of only $600 in a hot water heating plant that was put into his home. This is an excellent argument that can be used with profit when talking to prospects for heating plants, bathrooms, or anything else in the plumbing and heating line.

Goodhue & Co., of Rockland, Me., will do the plumbing and heating work on a new cell building to be erected at Thomaston, for which the Governor and Council have awarded construction and equipments contracts amounting to $69,410. The heating and plumbing contract was awarded to Goodhue & Co. at $4,219.40.

Work has been started on a new $25,000 public comfort station at Hampton Beach, N. H. The building will include in addition to the usual conveniences a women's rest room and a room to be equipped as an emergency hospital.

Don't forget to enter the August letter-writing contest!

PREPARING PLANS *and* SPECIFICATIONS *for* HORIZONTAL TUBULAR BOILERS

Practical Data for Heating Contractors Doing Medium and Large Size Work with Return Tubular Boilers, Regarding Specification for the Right Size Boiler to Obtain Satisfactory Results

By Charles L. Hubbard

EVERY heating contractor doing work of medium to large size has more or less to do with return tubular boilers, and it is proposed to give in the present article such practical data as will be useful in specifying boilers of different size to obtain the most satisfactory results. Some contractors make a practice of simply ordering boilers of a given horse-power from the manufacturers, leaving all details of construction to them. While this might be a perfectly safe thing to do with makers of standard equipment, it gives a large leeway for the builder to increase his profit at the sacrifice of durability, efficiency of operation and safety, while still fulfilling the requirements as to horse-power, as based on common practice.

While it is not necessary for the contractor to design the boiler in detail, there are certain points relating to general proportions, arrangement of parts, material, etc., which should either be shown by simple sketches or called for in the specifications. The sketches shown in the present case are taken in part from the writers' book "Power, Heating and Ventilation" (McGraw-Hill Book Co.), while others, showing standard tube sheets, were designed by him years ago for the particular conditions of heating, and have been thoroughly tested by extended use.

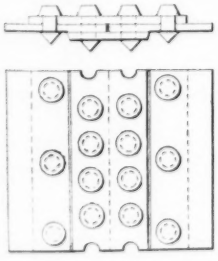


Fig. 1.

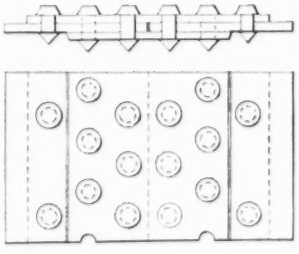


Fig. 2.

Materials.

Most boiler shells at the present time are made of "open hearth" steel, white "flange" steel, which is an especially ductile brand of the same variety, is employed for the heads.

The usual requirements are that the plates shall have a tensile strength of not less than 55,000 pounds per square inch of section nor more than 60,000 pounds.

The ductility should be such that a test piece 8 inches in length will not be reduced in sectional area more than 56 per cent when stretched to 125 per cent of its original length.

Rivets and all braces which do not require welding are of steel of a quality and strength similar to the plates. All stays and fastenings which require welding should be of the best quality wrought iron. Manhole frames and covers are made of a certain quality of cast-iron, called "gun iron," of

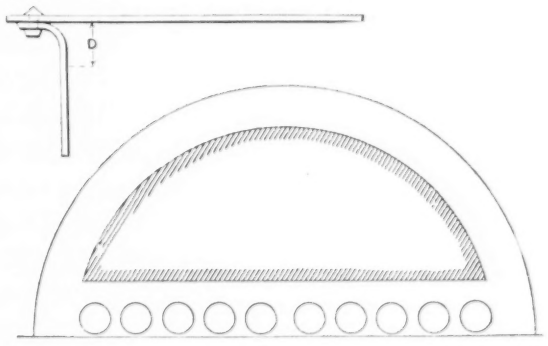


Fig. 3.

cast steel, and of mild steel or wrought iron pressed to the required form. While any of these materials are satisfactory for heating boilers, the latter is more frequently employed at the present time.

Thickness of Plates.

The relations between the thickness of the shell, steam pressure, and diameter of boiler, are given by the following equations:

$$t = \frac{d \times p \times F}{2 \times S \times E}$$

$$p = \frac{2 \times S \times t \times E}{d \times F}$$

$$d = \frac{2 \times S \times t \times E}{p \times F}$$

in which—

t = thickness of shell plates, in inches.

p = steam pressure, in pounds per sq. inch.

d = diameter of boiler, in inches.

F = factor of safety, commonly taken as 5 or 6.

S = ultimate strength of shell plates, in pounds per sq. inch, which is between 55,000 and 60,000 for mild steel.

E = efficiency of the riveted joint (longitudinal), which

may be taken as 80 per cent for the double-riveted butt point, shown in Fig. 1, and 87 per cent for the triple riveted joint, Fig. 2.

Table I gives the safe working pressure, in pounds per square inch, for boilers of different diameter and thickness of shell, with two types of joints and different factors of safety. This table has been computed by the above equations, and will be found convenient for reference in determining the thickness of shell for different conditions.

Table I.

Diameter of Boiler, Inches	Thickness of Shell, Inches	Factor of Safety 6 Kind of Joint			Factor of Safety 5 Kind of Joint		
		Single Lap	Double Butt	Triple Butt	Single Lap	Double Butt	Triple Butt
42	1/4	59	88	98	70	105	117
	5/16	73	110	122	88	132	145
	3/8	88	133	147	105	158	175
	7/16	103	155	170	123	185	204
	1/2	118	178	197	142	212	235
48	1/4	52	77	86	62	92	102
	5/16	64	96	106	77	115	127
	3/8	78	116	129	93	139	154
	7/16	90	135	150	108	162	179
	1/2	104	155	172	124	185	205
54	1/4	46	68	76	54	82	90
	5/16	58	86	96	69	103	114
	3/8	69	103	115	82	123	137
	7/16	80	120	134	96	144	159
	1/2	92	137	152	109	163	182
60	1/4	41	62	68	49	73	82
	5/16	51	77	86	62	93	102
	3/8	62	93	102	74	110	122
	7/16	72	109	120	87	129	143
	1/2	82	124	137	99	148	164
66	1/4	38	56	62	45	67	74
	5/16	47	70	78	56	84	93
	3/8	56	84	92	67	100	113
	7/16	66	98	109	78	118	130
	1/2	75	113	125	90	134	149
72	1/4	35	51	57	41	61	68
	5/16	43	65	71	51	77	85
	3/8	51	77	85	61	92	102
	7/16	60	91	101	72	108	119
	1/2	69	104	114	82	123	137

The single lap joint is only used for girth seams, in which case it is only subjected to the endwise pressure upon the heads. It can be shown by a simple calculation, that this

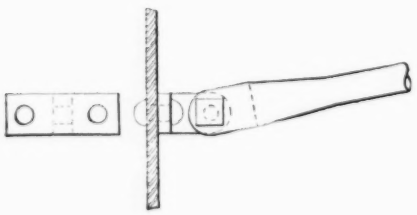


Fig. 4.

stress, for any given length of seam, is just one half that upon an equal length of longitudinal seam. A single riveted lap joint of usual dimensions has an efficiency of 50 per cent or more, so that if all girth seams are made of this type, the boiler will be as strong relatively as the solid plates, in a lengthwise direction.

Riveted Joints.

While lap joints, in case of longitudinal seams, are amply strong for considerable pressures when new, they have a tendency to become weakened through extended use, due to a slight bending strain when under tension. For this reason it is best to employ one of the butt or strap joints shown in Figs. 1 and 2, even for low-pressure heating boilers.

Dimensions for these joints are given in Table II, Fig. 1 being the "double-riveted" joint and Fig. 2 the "triple-riveted" joint.

In giving the pitch of the rivets in the girth seams it is assumed that their diameter will be the same as for the longitudinal seams.

For heating boilers, where the pressure is not to exceed 30 to 40 pounds for the driving of fan engines and pumps,

Table II.

Thickness of plate.	Diameter of rivets.	Pitch of rivets.	Width of outside butt strap	Width of inside butt strap	Thickness of butt straps.	Distance between rows of rivets	Edge of butt straps to center of rivets	Pitch of girth seam rivets.	Efficiency of joint.
Double riveted.									
5/16	1 1/8	2 1/2 x4 1/2	4 1/2	9	1/4	2 1/4	1 1/4	2 1/2	88%
3/8	1 1/4	2 3/4 x4 3/4	4 3/4	9 1/2	5/16	2 7/16	1 3/8	2 3/4	88%
7/16	1 3/8	2 1/2 x4 1/2 x5 1/2	5 1/2	10 1/2	5/16	2 3/4	1 1/2	2 3/4	82%
1/2	1 1/2	2 5/8 x5 1/4	5 1/4	11 1/4	3/8	2 7/8	1 5/8	2 3/4	80%
Triple riveted.									
5/16	1 1/8	3 1/2 x6 1/2	9 1/2	14	1/4	2 1/4	1 1/4	2 1/2	88%
3/8	1 1/4	3 1/2 x6 1/2	9 1/2	14 1/2	5/16	2 3/8	1 3/8	2 3/4	87.5%
7/16	1 3/8	3 1/2 x6 1/2	10 1/4	15 1/2	5/16	2 1/2	1 1/2	2 3/4	86%
1/2	1 1/2	3 1/2 x7 1/4	11	16 1/2	3/8	2 3/4	1 5/8	2 3/4	86.6%

the thickness of shell and type of joint should be such that the safe working pressure will not fall below 90 to 100 pounds with a factor of safety of 5 after the plates have been reduced in thickness 1/8th inch by corrosion.

For example—from Table I we find that a 54-inch boiler with a factor of safety of 5, a double-riveted joint, and shell plates 7/16th inch thick, has a safe working pressure of 103 pounds per sq. inch. Adding 1/8th inch for the effects of corrosion calls for 3/8-inch shell plates. On this general basis, using double-riveted butt joints, we may use the following thicknesses of plate for boilers of different diameter.

Table III.

Dia. of Boiler	Thickness of Shell
42-inch	7/16-inch
48-inch	7/16-inch
54-inch	3/8-inch
60-inch	3/8-inch
66-inch	7/16-inch
72-inch	7/16-inch

For higher working pressures, a factor of safety of 6 should be maintained after 1/8-inch reduction by corrosion has taken place, and the original thickness and type of joint should be chosen accordingly. As the shell plates in this type of boiler are exposed directly to the fire, they should not, in general, be over 1/2-inch in thickness, which limits the diameter for a given pressure. In practical work it will be found a convenience to make working drawings of the joints most frequently used, filling in the dimensions from Table II. These, for ordinary heating work, will include the single-

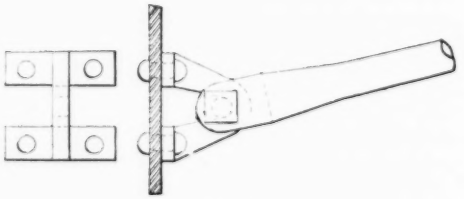


Fig. 5.

riveted lap and double-riveted butt joints for 5/16, 3/8 and 7/16-inch plates. With these once laid out, the drawings can be easily traced on the detail sheet of any set of heating plans with very little trouble. Boiler heads are usually made 1/8-inch thicker than the shell plates.

Tubes.

The sizes of tubes most commonly used are those having outside diameters of 2½, 3 and 3½ inches. A common rule for approximating the size to use in any given case is to allow 1 inch in diameter for each 5 ft. in length for anthracite coal and for each 4 ft. in case of bituminous. These proportions need not be accurately adhered to but will serve as a guide. The longer a tube, in proportion to its

Fig. 6.

diameter, the more necessary it is to keep it free of soot to maintain a proper draft through it. In a general way, the tube length should not exceed about three times the diameter of the shell, or a maximum of 3½ times. That is, 3×5=15 ft. in length and gives a good proportion for a 5-ft. shell, or 3½×5=16½ ft. as a maximum. The number and arrangement of the tubes is a matter of much importance. They should not be crowded together too closely, as increasing the number, beyond a certain limit, decreases their value as heating surface. There should be a clear space of 1 inch between them, both vertically and horizontally, with a vertical space of 2 inches at the center. The tubes should not be placed nearer than 3 inches to the shell, in order to give sufficient flexibility to care for the unequal expansion of the shell and head, and also to provide ample space for the circulation of water within the boiler. A clean space of at least 6 inches should be left below the tubes to serve as a mud drum.

Table IV.

Diameter of Boiler	Number of Tubes	Diameter of Tubes, Inches	Length of Tubes, Feet	Rated Horse-Power	Size of Grate, Inches	Size of Smoke Uptake, Inches
42	34	3	10	25	36x42	10x20
			11	28	36x48	10x25
			12	30	36x54	10x28
48	44	3	11	35	42x48	10x28
			12	38	42x54	10x32
			13	42	42x60	10x36
54	54	3	13	52	48x48	10x33
			14	56	48x54	10x38
			15	60	48x60	10x40
60	72	3	14	70	54x54	12x35
			15	75	54x60	12x40
			16	80	54x66	12x42
66	78	3½	16	102	60x60	12x44
			17	109	60x66	12x48
			18	115	60x66	12x48
72	98	3½	18	156	66x66	12x52
			19	165	66x66	12x52
			20	174	66x66	12x52

Boiler Horse Power.

In boilers of this type, used for heating purposes, it is customary to provide 12 sq. ft. of heating surface per rated horse power, which, with a suitable furnace and chimney draft, will allow forcing from 30 to 40 per cent for considerable periods without serious loss of efficiency.

Table IV gives data regarding the size, proportions and number of tubes for different horse powers. The number and size of tubes, length of shell, etc., is given for a range which includes the best practice for boilers of different diameter. While there are no hard and fast rules as regards general proportions, it will generally be found more satisfactory to keep approximately within the limits given. The grate area in each case is based on average conditions in well cared for plants operating under natural draft.

In making the computations an evaporation of 8 pounds of steam per pound of coal has been assumed, with a combustion of about 10 pounds of coal per sq. ft. of grate per hour for the smaller sizes, up to 9 and 20 pounds, respectively, for the larger ones.

The higher rates of evaporation and combustion allowed for the larger sizes of boilers are due to the fact that these are generally employed in plants of larger size, which have

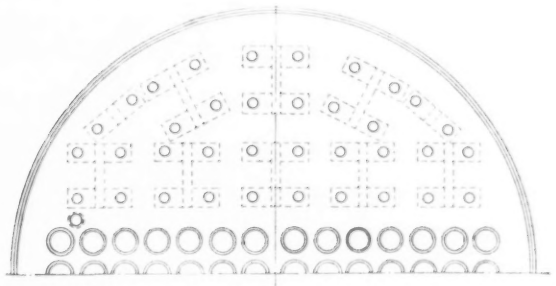


Fig. 7.

higher chimneys, and are usually in charge of more skillful firemen.

If a single large boiler is to be used for low pressure heating in a building where the draft is not especially strong and where ordinary janitor service is employed, a larger grate should be used, as the rate of combustion will be lower. For cases of this kind about 0.3 to 0.35 sq. ft. of grate surface per horse power should be allowed. In general, a hand-fired boiler should not be over 60 inches in length, or 66 inches at the most, because it is difficult, if not impossible, to properly care for the fire at the rear of a grate longer than this.

When different tube lengths are desired from those given in Table IV, the following may be used in determining the horse power:

Table V.

Diameter of Boiler (Inches).	Horse-Power per Ft. in Length for the Number and Size of Tubes Given in Table IV.
42	2.5
48	3.2
54	4.0
60	5.0
66	6.4
72	8.7

When it is desired to compute the grate area for any particular set of conditions, Table VI may be used, which gives the sq. ft. of grate per horse power.

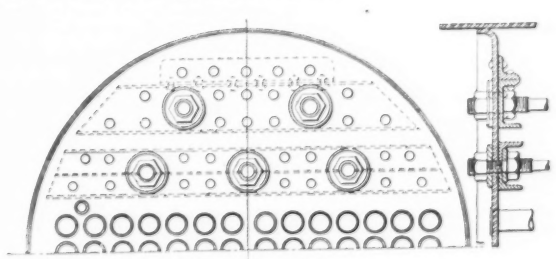


Fig. 8.

Boiler Bracing.

The surface to be supported by the braces is evidently that portion of each head above the tubes. In practice, however, it is not necessary to put in braces enough to sustain the whole of this area, for the reason that the head is flanged and riveted to the shell, so that a portion of it becomes stiff

enough to carry the pressure without depending upon the braces. When a boiler head has several rows of tubes expanded into it, a portion of the plate, for a short distance above the upper row, is sufficiently supported, thus leaving an area of the shape and location shown in the shaded portion in Fig. 3 to be carried by the braces.

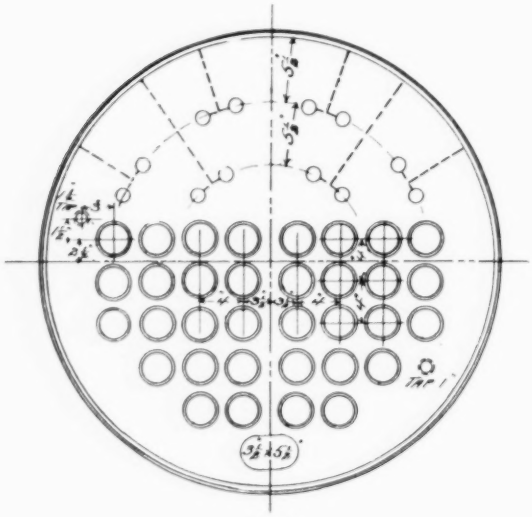


Fig. 9.

The two methods commonly employed for staying the heads of horizontal tubular boilers, are known as "diagonal" and "through" bracing.

Diagonal braces are of two kinds, the older type called "crow-foot" braces, shown in Figs. 4 and 5, and the solid brace illustrated in Fig. 6. The first of these, called a single crow-foot, is attached to the head with two rivets, while the double type (Fig. 5) has four rivets. In each case the connecting rod or main brace is carried back diagonally and riveted to the boiler shell. The general arrangement of braces of this type is shown in Fig. 7.

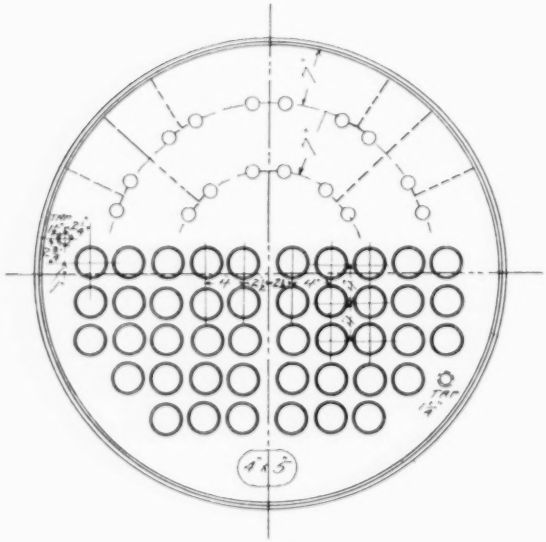


Fig. 10.

Diagonal braces are generally employed entirely for the smaller sizes of heating boilers, and in connection with "through" braces for those of larger size, as will be shown later. "Through" bracing consists of rods passing through the entire length of the boiler, with heavy nuts and washers at the ends on the outside and check nuts on the inside. Stiffening pieces of channel or angle iron are riveted to the heads to support them. The details of "through" bracing are shown in Fig. 8.

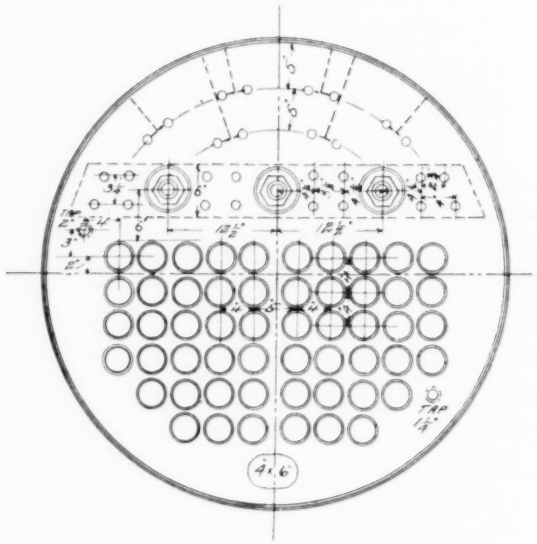


Fig. 11.

Table VI.

Pounds of Steam per Pound of Coal	Pounds of Coal Burned per Sq. Ft. of Grate per Hour.			
	10	12	15	20
8	0.43	0.36	0.29	0.22
9	0.38	0.32	0.25	0.19
10	0.35	0.28	0.23	0.17

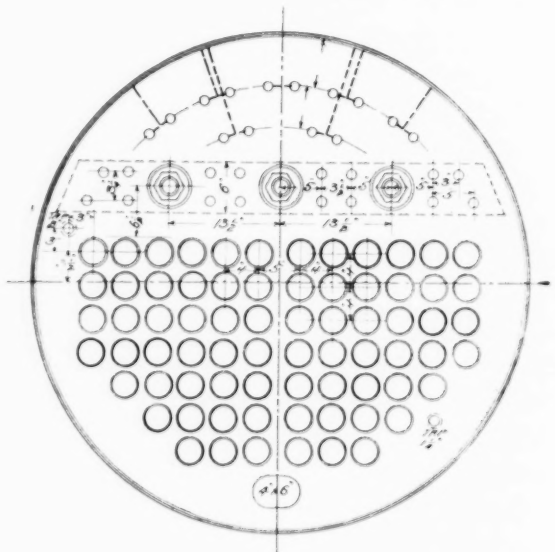


Fig. 12.

"Through" bracing is commonly employed in boilers of larger size (66 and 72-inch), but in smaller sizes it makes it difficult to enter the shell for inspection, and the diagonal type are more commonly employed for the upper rows.

As the computations for boiler bracing are rather complicated, a series of working drawings of the tube sheets for

different sizes are given, with all necessary data as to size of braces, rivets, etc., which may be transferred directly to the heating plans and specifications of any given plant. These tube sheets are designed in all cases for a working pressure of 100 pounds per square inch with a factor of safety of 6.

Data for Fig. 9.

Diameter of boiler, 42 inches; number of tubes, 34; diameter of tubes, 3 inches; number of diagonal braces, 6; length of braces in outer row, 42 inches; length of braces in inner row, 48 inches; diameter of rivets, 1 inch.

All diagonal braces used in Figs. 9 to 12, inclusive, are of the solid pressed steel type, shown in Fig. 6, having a sectional area of not less than 1 square inch in their weakest parts and fastened with two rivets at each end.

Data for Fig. 10.

Diameter of boiler, 48 inches; number of tubes, 44; diameter of tubes, 3 inches; number of diagonal braces, 8; length of braces in outer row, 42 inches; length of braces in inner row, 48 inches; diameter of rivets, 1 inch.

Data for Fig. 11.

Diameter of boiler, 54 inches; number of tubes, 54; diameter of tubes, 3 inches; number of diagonal braces, 6; length of braces in outer row, 42 inches; length of braces in inner row, 48 inches; diameter of rivets, 1 inch; number of through braces, 3; diameter of through braces, 1½ inches; end upset to 2 inches; channel bar, 6″×2.39″×0.52; channel bar rivets, 1 inch.

Data for Fig. 12.

Diameter of boiler, 60 inches; number of tubes, 72; diameter of tube, 3 inches; number of diagonal braces, 7; length of braces in outer row, 42 inches; length of braces in inner row, 48 inches; diameter of rivets, 1 inch; number of "through" braces, 3; diameter of "through" braces, 1½ inches; end upset to 2 inches; channel bar, 6″×2.39″×0.52; channel rivets, ⅛ inch.

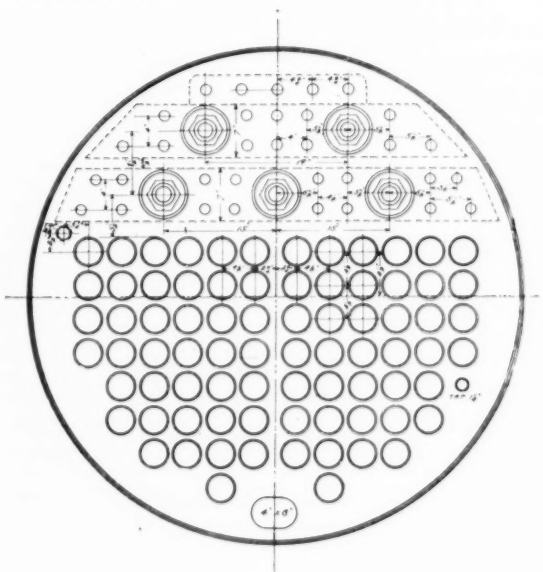


Fig. 13.

Data for Fig. 13.

Diameter of boiler, 66 inches; number of tubes, 78; diameter of tubes, 3½ inches; number of "through" braces, 5; diameter of "through" braces, 1¾ inches; ends upset to 2¼ inches; channel bars, 7″×2.67″×0.57; angle bar (long flange riveted to head), 3½″×3″×⅛″; diameter of channel and angle rivet, 1 inch.

Data for Fig. 14.

Diameter of boiler, 72 inches; number of tubes, 98; diameter of tubes, 3½ inches; number of "through" braces, 5; diameter of "through" braces, 1¾ inches; ends upset to 2¼ inches; channel bar, two 3½″×2½″×⅛″ angles (with longer flanges riveted to head); angle bar, 3½″×3″×⅛″ (with longer flange riveted to head); diameter of channel and angle rivets, 1 inch.

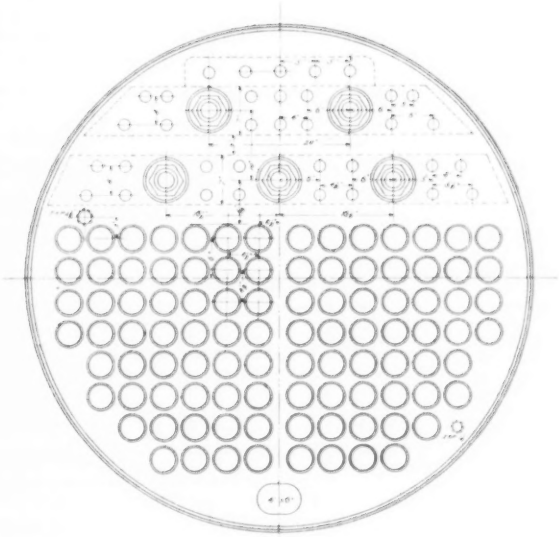


Fig. 14.

Nozzles, Brackets, Feed Pipe, Etc.

Access to the interior of the boiler is provided for by a manhole, usually located in the top of the shell. This must be large enough for a man to enter and is commonly made 11 inches by 15 inches.

A hand hole is placed in each head below the tubes, as shown in the tube-sheet details. This is partly for inspection, but more particularly for use in washing out the boiler.

Horizontal tubular boilers are usually supported by wrought or cast-iron brackets riveted to the shell and resting upon the brickwork of the setting.

Boilers up to 17 ft. in length may be provided with two pairs of brackets, while those of greater length should have a third pair placed midway between the other two.

The Volume of business, as measured by debits to individual accounts reported to the Federal Reserve Board for banks in 155 important clearing house centers, increased from $7,335,000,000 for the week ending July 13, to $7,417,000,000 for the week ending July 20, an increase of $82,000,000, or about 1 per cent. Several of the leading centers, including Detroit and San Francisco, report considerably smaller totals than the week before. As compared with the corresponding week in 1920, debits for the week ending July 20 are smaller by $1,798,000,000, or about 19 per cent, this lag being comparable with 21 per cent shown for the preceding week. For New York City, debits for the week under review were 13 per cent below the corresponding figures in 1920.

Danger Ahead.

A Manchester grocer is advertising for a man to look after customers, partly outdoors and partly indoors. We dread to think what will happen to him when the door slams.—Punch (London).

TO STOP PAYMENT OF A CHECK.

By Ralph H. Butz.

The drawer of a check has the right to countermand its payment at any time before it is paid or certified and delivered to a bona fide holder for value. As nearly all business men have occasion to stop payment of checks at some time, this rule is really more important than it may seem to be.

For instance, a check may be issued and mailed to the payee, and later on the maker of the check may discover that for various reasons the check should not have been sent. Or a check may be lost, stolen or mislaid. Whatever reason there may be for its non-payment, the maker should notify the bank on which the check is drawn, giving a complete description of the check and ordering the bank to stop payment on that particular check.

After the bank receives notice to stop payment, and through some error or fault of its own pays the check, the bank may be held liable for the amount thus paid, having no right to charge the amount of the check to the depositor's account.

Some banks, however, avoid liability for their negligence by having the depositor sign a printed form. These printed agreements usually contain a statement to the effect that the depositor agrees not to hold the bank liable should it pay the check on which payment has been stopped. Of course, if the depositor signs such a contract he releases the bank from all liability. It is, therefore, quite important that the depositor be very careful as to the contract he signs when he asks the bank to stop payment on a check.

A case was brought before one of the higher courts quite recently in which a depositor admitted having signed a card on which was printed the usual notice to the bank to stop payment on a check, and also the following agreement:

"The ..... Trust Company will please stop payment of the above described check. The undersigned agrees to hold the ..... Trust Company harmless for said amount and for all expenses and costs incurred by it on account of refusing payment of said check, and further agrees not to hold the ..... Trust Company liable on account of payment contrary to this request, if same occur through inadvertence or accident."

At the trial it developed that the bank had paid the check after it had received notice to stop payment; also that the maker of the check did not have sufficient funds in the bank to cover the amount of the check. The bank, after paying the check, charged it to the account of the depositor, and then brought suit to collect the amount by which the account was thus overdrawn.

The defendant (maker) claimed that he did not read the agreement on the card which he signed, and that, therefore, he was not bound by such a contract. But the fact that the defendant did not read the agreement printed on the card did not affect the rights and obligations of the parties. He was assumed to have read the contract and to have assented to its provisions, agreeing to be bound by its terms.

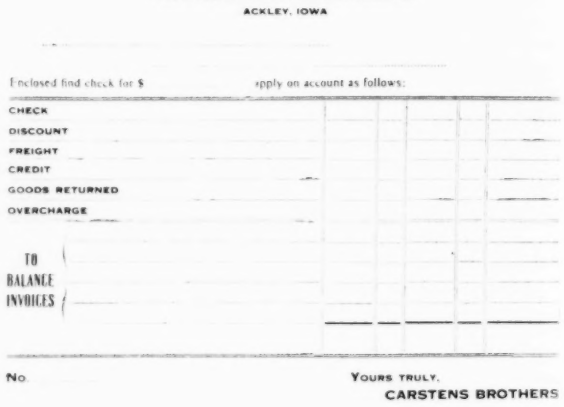
"By the great weight of authority the drawer of a check retains the right to countermand its payment at any time before it is paid or is certified and delivered to a bona fide holder for value. In the *absence* of an express contract limiting its implied obligation to the drawer, the drawee pays at his peril when payment of the check has been stopped. The payee is not an assignee of the fund and the bank incurs no obligation to him before its acceptance of the check. His rights are against the drawer of the check.

"Two decisive questions are presented: (1) Do the terms of the agreement include negligence? (2) Is it illegal for a bank to contract against the negligence of its employes in failing to stop payment of a check after receiving an order to stop its payment? The word 'inadvertence' in the printed agreement embraces the effect of inattention, the result of carelessness, oversight, mistake, etc. The word 'accident' is used in the sense of a happening without the concurrence of the will of the person by whose agency it was caused. It is manifest the quoted words were intended to exonerate the bank from the kind of negligence shown by the record, and we are unable to see anything illegal, or anything opposed to public policy, in a stipulation or agreement which relieves a bank so circumstanced from the results of the mere inattention, carelessness or mistakes of its employes."

(Copyright, 1921, by Ralph H. Butz.)

A Complete Remittance Form.

When sending checks to supply houses, it is essential that there should be a clear understanding to both the contractor and jobber or manufacturer as to what goods the money applies on. Part of the bookkeeping system of Carsten Bros., Ackley, Iowa, includes the form shown in the accompanying illustration,



and is known as the remittance form. Whenever a check is sent, this form is filled out properly and made in duplicate, one copy going to the supply house, the other remaining in the office, where it is carefully filed away for reference.

A national industrial committee has been organized by the National Civic Federation "to bring together the representatives of the non-revolutionary labor movement, the employers who believe in conferring with labor, and the representatives of the general public." President Harding, Secretary Hoover and Secretary of Labor Davis are reported to have expressed hearty approval. The object of investigations and conferences will be to discover the ways of arriving at a sane understanding between capital, labor and the general public and of constructing a general platform on which these three great divisions of society can stand together. There will be considered elective bargaining, commercial arbitration, industrial democracy, unemployment, American shop movement, and in discussion of the last, answer will be sought for the question whether the movement is a camouflage scheme to destroy the trade unions, as is charged by leaders of labor.

"Pa, what are ancestors?"

"Well, my son, I'm one of yours. Your grandpa is another."

"Oh! Then why is it people brag about them?"—Boston Transcript.

A PLEA *for* BETTER SELLING METHODS *and for* "FRONT *of* SHOP" PRACTICE

By James Mackay

ONE of the most overworked words in the language of business and especially that branch of business which pertains to selling, is "psychology." Much that is pure, unadulterated old-fashioned "bunk" is being put across in the name of that honest and very descriptive word. The particular "ology" represented by it, has to do with the operation, impressions and impulses of the mind. It really shoots a little over the mark in a descriptive way. More accurately it pertains to the things of the soul. But it is a very fancy looking word, sounds as if its enunciator must be one of prodigious understanding of the dark unfathomed depths of the spirit, and hence it falls glibly from the tongues of those who would teach us how to sell.

But while, as remarked above, much that is perpetrated in its name is of several varieties of buncombe, yet there is much of truth and good hard sense in what the purveyors of trade psychology tell us. Perhaps it would "get across" much better if it were not dressed in such a fancy costume.

Accounting and Selling Ability Essential.

The selling end of the business is too much neglected by the heating and plumbing contractor. As a rule they lean to the mechanical side of the profession too much and lay too great an emphasis on the importance of that part of the business. It is the most important, too, as if the contractor does not maintain good mechanical standards and practices, he cannot meet with large success. But just because it is the most important does not excuse the neglect of those two other and really almost indispensable adjuncts to a successful business, namely, the science of accounting and the science of selling. Things are sold because the purchaser believes he is receiving full value for his outlay. In ordinary merchandising the purchaser usually has the advantage of being able to personally inspect the completed article, and the reputation of the seller is therefore not of transcendent importance, although it is a very large factor, too. But to one dealing in finished materials, all that has to be looked to is the observance of ordinary common honesty, the charging of a fair price, and a good location for carrying on the business. But still another factor has entered, more especially of late years, in retail merchandising. That is the very decided influence of good appearance of the place of business and the extent to which the spirit of courtesy and the desire to serve pervades the institution.

Reputation Predominating Factor.

The things which are sold by the heating and plumbing contractor are capable of personal inspection by the intending purchaser only in a detached state. What he sells is something to be assembled in the future, and therefore the personal character of the contractor and the reputation of the concern is the predominating factor, as affecting the probable value of the complete work.

So it should follow as a natural corollary that the most successful contractor is he who has earned the reputation for doing reliable work. However, the existing fault with the men in this profession is that they often fail to make adequate effort to bring to the attention of their prospective clients a comprehensive picture of what they are capable of doing, and what the client may expect in his own case. To be successful in a large sense, one must first do good work at a good profit; second, look successful, and third, advertise both facts in every manner possible.

Personal Appearance Counts.

Business men like to deal with those who are successful. Man is the most impressionable of animals, and of all the organs of sense which convey impressions to others, probably the eye carries the quickest and most vivid, as well as the longest remembered. So, falling back on our high-sounding word, the psychology of success must take into account visual impressions, and note the value of personal appearance. Whether we wish to or not, the habit of estimating those we meet is so fixed that, even when we try to withhold judgment, we do unconsciously form an opinion of the character of all those with whom we deal. This estimate takes in the personal appearance, the habits, the mental qualities of the man, and extends to a summing up of the impressions created by the appearance of the place of business. So that unless the difference in price is too great, the one most apt to land the order, is the one who has made the best *visual* impression, granting that the class of work done is *thought* to be equal. The financial ability of a concern, of course, enters into the equation, but not as often as might be thought. Having made that first visual impression a good one, it follows that it should be improved and added to by a skillful presentation of evidence tending to convince the prospective purchaser of the contractor's skill, knowledge and reliability as indicated in his previously finished work. A great aid in this presentation is photographs of both interior work and of the finished buildings from the exterior. This will lead quite naturally to a discussion of the details of the work. Any contractor who has successfully carried on a business for any length of time will have accumulated a number of incidents and anecdotes which bear on the good quality of his work, the pleasure and comfort his clients experience, and the ease and economy of the operation of the work. And do not let any false modesty lead you to the use of the soft pedal. Play a loud and lively tune. Any man should be enthusiastic about his own work, and it is not only excusable, but is positively to be expected that he "blow" about his work. If you do not most thoroughly enthuse about your own work, you cannot expect to make much of an impression on the other fellow. Give details which bear on little unusual services you have rendered your clients. Make the prospect feel that in coming into the circle of your customers, he is coming among friends, and will be well taken care of. Let him feel that while you are in business for profit, that that profit is rea-

sonable and that first, last and always the business is your greatest pride, and that you place a high value on its good name, and that it is only by setting a high standard of service and quality that it can be maintained.

Don't Take Too Much for Granted.

Too many contractors think their ability and reputation is taken for granted by the ones who have asked them to bid. No mistake is more common and none greater. You must always recollect that you have at least one, and sometimes more, competitors on practically every job. Very likely all feel as you do. If you are progressive enough to put this practice behind you, very likely you will get the job. For you will then regard the chance to bid on the job, not merely an invitation to bring in a bid and dumbly lay it on the desk, but rather a chance to *sell the job*, not merely *have it awarded to you*. Selling a job consists in (to revert to the somewhat hackneyed phrases of the psychologist) first, sizing up your prospect, then a proper approach, a presentation of your facts, a clear comprehensive explanation of what you propose to install, a good closing argument and a driving through to the point where the order is closed. Just because it is the practice to wait until all the bids are in, need not deter you from making a vigorous effort to close it *now*. You will very likely be able to make suggestions looking to a better arrangement of the fixtures, the pipe work or the amounts to be installed, and if these are carefully considered before being suggested, may give your prospect such a good impression of your ability as to cause him to award you the contract at your bid, without waiting for the others to be submitted, or may tell you to go ahead on a percentage basis. Be prepared, should this latter proposition come up, to give him details as to the prices of various items, the addition or deduction if suggested changes are made, and be able to convince him, in any event, that whether or not your price is within his estimate, or that of any other bids he may have received previously, that your percentage of profit is reasonable and that of "overhead" based on ascertained expenses. Any man worth dealing with wants you to make a reasonable profit. Don't for any reason, ever take a job at cost and don't try to impress your prospect with the idea that you are "changing dollars." It isn't good business and it isn't good salesmanship.

Have a Definite Plan.

The procedure in making a sale is very much the same as that followed by a lawyer in bringing his case to the jury. In the first place, previous to getting on his feet and during the course of the trial, he has "sized up" each juror; has determined on special stress points aimed at individuals and on several "mass plays" aimed at the jury as a whole. He has mapped out a definite plan to follow throughout his address and knows what he is going to "hammer home" at the end. When facing his jury, he is prepared to look, or do, or say, something which will give the jury an immediate good impression, and enlist their favorable attention. This introductory play is brief; as soon as possible, consistent with completing properly his introductory remarks, he proceeds to a logical, well-connected presentation of the facts, he then proceeds to analyze each fact, and connects them up in their bearing on the matter at issue; he then makes his appeal, skillfully using every power at his command to sway the opinions of his auditors. Finally he centers all his force in his closing argument with the intention of fixing in the minds of the jury a determination to bring in a verdict favorable to his client. This whole proceeding may be called the painting of word pictures. The lawyer must first form the picture in his own mind, and then must cause this same picture to appear upon the minds of his listeners. Depending on the clarity of the picture in his own brain, and his skill in conveying it to the minds of the jury will depend the impression made.

How to "Size Up" the Job.

So it is in selling. In the case of contracting work, where various materials are to be assembled, during the taking off of the items, and after, the job should be given careful study; changes that would be beneficial should be noted; similar work done in the past compared to it; the fitness of the several articles you are going to include in your bid. In a word "size up the job." Then learn all you can about your prospect; what mutual friends you know; what clients of yours would impress him favorably if mentioned; what work of yours he may possibly be familiar with, and what would be impressive jobs to mention; make up your mind what you are going to stress when you present your case; whether initial economy, future economy, ease of operation, comfort, convenience, luxurious appearance, etc., would most likely appeal to him. You may on meeting change your method of presentation, but it is good to have a plan anyhow, even if you do decide not to use it. And it is well to note, too, that a stubborn adherence to plan sometimes defeats a salesman. Points may develop which make advisable a complete alteration of the method planned, and a salesman should have an elastic, quickly adjustable brain. Decide beforehand what you will say to illustrate your talk, what comparisons you intend to make, what information relating to similar installations you intend to give. Provide yourself with all data bearing on the job. Ascertain what would be the most favorable time of the day to interview the prospect. Make an engagement for that time and be prompt in keeping it. If you are unknown to the prospect, make as good an impression as possible on that first interview. This is usually accomplished by just being yourself. Make your introductory remarks clear, sensible, comprehensive and brief. Present your facts, explain the various details with just enough technical language to impress your client with your mechanical fitness. Don't talk "over his head," in the matter of trade terms. Make comparisons which will enlighten him on the probable success of the work you intend installing; talk over other jobs you have done, illustrate with any reminiscence which might favorably impress him; show photos of your work, both interiors and exteriors; give him lists of installations on which you are sure there are no petty complaints; talk over these lists in detail, and do not give him a list of factory jobs, if you are selling him a residence installation. After you have proceeded thus far, make your "appeal"—sum up the reasons why he should award the job to you; never be undignified enough to advance as a reason that you need the work. Then close the deal, as rapidly as possible. During the above procedure, you should lead the talk, and dominate its direction, but give the prospect ample opportunity to ask questions, and don't talk yourself out of the job. It is better to leave things unsaid and return for another interview than to weary the prospect. And avoid being trivial, and don't make the mistake of telling funny stories in order to become on more familiar terms. These usually divert the attention, often fall flat, and are almost certain to weaken your case. If you know the prospect well, of course, that is entirely a different matter, and even with stangers there are, of course, exceptions; often a well told anecdote will immediately put one on friendly terms and clinch an argument. In case the order is not secured at the first interview, it is advisable often to try for a luncheon appointment at the second interview. These are always desirable for the reason that no matters foreign to the business in hand intrude on your prospect's attention, and one always has the advantage of being at ease and on more friendly terms.

(To be Continued.)

CONSTRUCTIVE IDEAS *in* JUNE PRIZE LETTERS

Letter Writers in June Contest Urge Contractors to Do More Merchandising, Enlighten Public Regarding Their Trade, and Further the "Bath a Day" Movement

LETTERS entered in the June contests prove that many plumbing and heating firms have bookkeepers and other office assistants who are alert and wide-awake. They are giving their trade serious consideration and offer excellent suggestions for extending and improving the contractors' business. Some of them point out how these ideas have been made use of by contractors in building up their business.

The first prize, $15.00, goes to Robert E. Urfer, bookkeeper for W. T. Delahunty & Co., Decatur, Ill., a progressive firm whose marked success can be attributed to its modern merchandising policy. Up-to-date window displays, showrooms, and extensive advertising have played a big part in the success of this company, which was one of the first of the plumbing and heating firms to realize the possibilities of the "Bath a Day" movement and to make it a success in the city of Decatur.

The $10.00, second price, was awarded to Earle C. Sabin, cashier for the Reliable Plumbing & Heating Company, of Champaign, Ill. Mr. Sabin's letter deals with the importance of informing the public more fully regarding the contractor's business, in order that people generally may know the part that the plumbing and heating trade has done for the progress and development of the country. The writer is in a position to know whereof he speaks, for he is connected with one of the most progressive plumbing and heating establishments in the State of Illinois.

To Helen Howard, bookkeeper for a plumbing concern in Bloomington, Ill., is awarded the third prize of $5.00 for her letter on the advantages of modern plumbing, in which she urges the plumbing and heating trade to do everything to further the "Bath a Day" movement, both as a service to the public and as a means of increasing their business. This is the second prize won by Miss Howard, she having also been a successful entrant in the April contest.

"Domestic Engineering" wishes to thank the writers of the many other interesting letters received and hopes that their next efforts will place them on the list of prize winners.

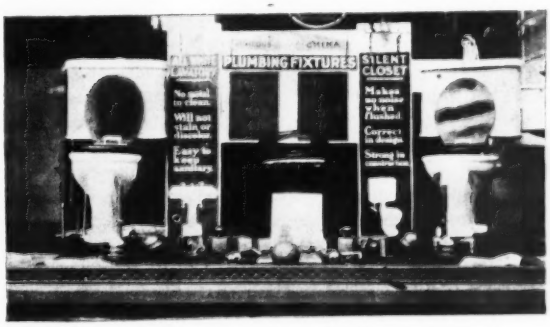
The Letter That Won First Prize, $15.

When a merchant spends money for advertising he pays for space just the same as when he pays rent. Both must produce profits. If he is an alert, wide-awake merchant he will see to it that both advertising space and store space produce profits.

Any business whether large or small can increase its profits by the right kind of advertising and the proper displaying of its merchandise. Money saved by renting or buying a business building that is not suited to its requirements, in every way, is false economy. A store building should be built to conform to the requirements of the business, not the business to the building, which is most easy to secure.

There is a wonderful opportunity for trade extension in the plumbing and heating business. There is a great field awaiting the plumber who is alert and will devote some of his time to study. Many plumbers do not attempt to do much retail business, because they have not taken the time to investigate the possibilities of retailing in the plumbing line. A large majority of the plumbing and steamfitting concerns have been developed by practical plumbers and steamfitters, who have devoted most of their time to manual labor, and have overlooked the big end of their business—that of expanding, advertising, displaying of their merchandise to the best of advantage, creating a demand for better quality goods, operating efficiently and selling a maximum amount of goods at a fair profit. The concern that cannot sell efficiently cannot expect to grow very large.

There is no reason why any wide-awake plumber should not maintain an efficient retail department, because it will not only pay its own way, but if properly conducted will bring many customers into the store, who when in need of



Closet Display Conducted by W. T. Delahunty & Co., Decatur, Ill., During the Recent Health Campaign in That City.

plumbing work will naturally turn to the plumber with whom they are accustomed to do business. A properly conducted retail plumbing department will go a long way towards paying the overhead expenses of a plumbing shop. The profits from such a department should not only pay the necessary additional sales force, but should pay for all necessary office salaries and the expenses of the entire business. And with efficient office and sales force the plumbing and heating business will soon be placed upon a much higher standard in the business world.

The largest businesses in the world secure the best possible location for their business, advertise persistently and have excellent window displays. The American plumbing and heating contractor caters to the very highest class of trade, and yet you will find a great majority of these plumbers and steamfitters located in cheap-rent districts, with very little attempt being made to display their merchandise in an attractive way. American people are pro-

gressive, and they want to appear progressive, and will naturally do their trading at places that seem most progressive. It would seem that many plumbers and steamfitters have overlooked this fact, and you will find that the plumber who recognizes this fact has a good location for his store on the ground floor, in a building that meets his requirements, handles only quality goods, displays them to the best of advantage, goes after business in a business-like manner, advertises, and gives service with a smile. You will also find that this plumber not only appears progressive, but is progressive.

It is human nature for one to criticize other people and their methods. Therefore, we always keep one eye on the other fellow. When we see something which he does and which we think is not strictly up to "Hoyle," we try to improve ourselves along that same line. When we find new ideas being used in other places, we compare them with our own and, if thought advisable, make the change.

One person in the store is worth a hundred not in the store. We attempt to get as many people into our store as possible. People naturally do not frequent a plumbing shop as often as a grocery, dry goods or drug store. They buy a bathroom outfit and have it installed and possibly never visit a plumbing shop again as long as they are able to "get by" with the equipment which they have, and they give no further thought to more modern equipment. Unless they travel or visit often, they do not know that possibly their present plumbing equipment is way out of date. They do not know of the many modern conveniences in the plumbing and heating line, and they are not personally acquainted with the plumber.

Many of them do not know that the plumber has any grievances, just as they themselves have, and when, once in a great while, they get a bill from the stranger plumber, they naturally doubt its correctness because their equipment is old and requires more attention than they thought would be necessary, and then again the plumber is practically a stranger to them, and they have their doubts about him. Therefore, we endeavor to induce as many people as possible to come into our store and get acquainted. Our greatest asset is satisfied customers. We secure more new customers through old customers than in any other way.

We do not intend to make a club room of our store. That is not necessary. There are different ways of getting customers into a store. First, there must be an inducement and a desire created. During the month of May we had a special One Cent Sale on toilet paper. We buy toilet paper in large quantities. We sold five rolls of regular 10-cent value paper for 50 cents, or ten rolls for 51 cents. We had intended running this sale for one full week, but in three days we sold our entire stock of paper. We do not put cheap material into these sales, as the object of these sales is to secure satisfied customers. By buying in large quantities we were able to make a small per cent on the paper. Almost everyone who bought some of this paper told a friend about it, and we had them talking about our store. We had people coming into our store whom we had never seen here before. And toilet paper is not all that we sold that week. We sold quite a number of small bathroom fixtures, such as towel bars, toilet paper holders, etc. And the following week we sold some small bathroom fixtures to different customers who had noticed them while buying toilet paper. Just inside our front door we had a complete bathroom display that was admired by many of the customers. This complete outfit was soon afterwards sold for cash, although the customer was not ready to have same installed at the time, but the complete outfit appealed to him and he bought it "on the dot."

A few weeks later we conducted a gas water heater campaign. We installed a complete bathroom outfit in our window, together with a range boiler and a gas water heater. Three different Saturday nights we had a small colored lad, a dancer, take a shower bath in our window, hot water being furnished by the gas water heater in the window. Hundreds of people stopped and watched this. In fact, it was the talk of the town. We advertised it in the local newspapers, and printed signs in the window, told the crowd about the heater and the shower bath demonstration.

During this campaign we sold twelve gas water heaters, secured new customers for plumbing installations and our cash sales for that month were more than any previous month in the last two years. Our increase in cash sales alone that month paid for all display advertising and other necessary expenses in putting on this campaign.

In my estimation plumbing is a most honorable profession. Actual facts from a United States Government survey, in Johnstown, Pa., in 1915, show that in homes without bathtubs the death rate for babies reached the alarming rate of 164.8. Homes equipped with bathtubs showed the death rate to be only 72.6, less than half the other figure.

Plumbers! See that you have the very best bathroom equipment in your own home first, and take a bath every day. Doubtless if every plumber would practice this habit every day he would become very much more enthusiastic about it, and the next few years would see wonderful improvement in the plumbing business. The slogan "A Bath a Day Keeps You Fit Every Way," is worth while telling to the public. I know from personal experience what a bath a day means. When plumbers do this, then they will be in a position to go out and tell the world just what modern plumbing means—the preserving and lengthening of our natural lives—health and happiness, and that by modern plumbing we measure the progress of civilization.

When the public is thus educated the plumber will no longer be looked upon as a necessary evil, and be the object of ridicule and jokes, but will be praised as one of the necessary factors in the progress of civilization.

Let us all get together on this, and let the American people know just what modern plumbing means to each and every one of us. The American people will do anything, if they can be convinced that they will improve themselves by doing it. Now is the time for the plumbing and heating contractors to "snap out of it." 1921, and every year, will reward fighters. Let us all be real honest-to-goodness fighters.

Robert E. Urfer.

The Letter That Won Second Prize, $10.

In every community there are a number of men in business or professions who make their community what it is, a success or failure. Among the men who comprise this group are men of all classes. These men, who are chiefly responsible for the success of their community, are looked up to by the balance of the citizens with varying degrees of appreciation, according to the success of their business, or the profession, in which they are engaged.

Professional men, doctors, lawyers, etc., are usually looked up to with great respect. Successful business men in most other lines are also accorded their dues, but where do the master plumbers stand in this estimate? Are they accorded the same degree of respect as the professional man or the proprietor of the large department store? Or are they looked upon merely as a necessary evil?

What have we done as an organization in our own community to educate the public to the fact that we are a prac-

(Continued on Page 225.)

QUESTIONS & ANSWERS

This department is a clearing house for ideas and is open to every reader of "Domestic Engineering." Problems sent in are replied to at the earliest possible moment by "Domestic Engineering," and this department can be made more valuable if readers themselves will help the man who needs assistance. Read the questions and answers. If you have had similar problems, or know from experience how the faults can be remedied, do not hesitate to send in your comment or criticism. It will be some satisfaction to you to know that you have helped a fellow craftman and a pleasure for us to pass on the data. "Every man owes some of his time to the upbuilding of the profession to which he belongs."

WANTS INFORMATION ABOUT HEATING CREOSOTE IN HOUSE HEATING BOILER.

Editor "Domestic Engineering":—Herewith you will find a rough sketch, which I trust is sufficiently plain for you to understand my wants. This represents a small creosoting plant for creosoting fence posts, ties, etc.

The large tank on the left of the boiler is a reserve or supply tank carrying several thousand gallons of cold creosote at about 50 degrees Fahr. In the middle is represented a boiler, and to the right the vat in which the posts or materials to be creosoted are placed.

The plan of the inventor of this miniature outfit is to use an ordinary cast iron boiler such as would be used in house heating, if in your opinion this would be practical, and to exert by compressed air a pressure on top of the supply tank something like ten pounds, or sufficient to force the creosote thru the

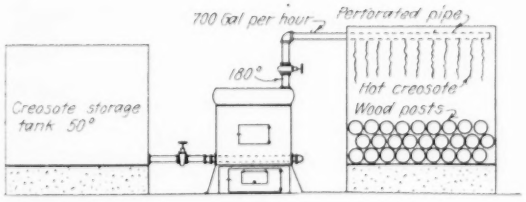


Fig. 1.

boiler and into the top of the receiving vat, there entering pipes filled with holes, and the hot creosote will drip down over the posts.

You will note gate valves located on each side of the boiler. These are intended to be closed sufficiently to retain the creosote in the boiler long enough to raise it in temperature from about 50 to 180 degrees.

The point I want to get at is how large a boiler would be required to deliver something like 700 gallons of creosote from one tank to another and raise the temperature from 50 to 180 degrees. In answering this inquiry, please state the size of boiler you would suggest in ordinary house heating rating, that is 900, 1,500 or 2,000 ft.

In your opinion will the creosoting material affect the boiler either in the way of corrosion or a deposit of tar over the inner surface which in time would deteriorate from its efficiency?

Indiana. C. F. C.

To heat creosote from a temperature of 50 degrees to a temperature of 180 degrees requires the expenditure of considerable more heat units than would be required to heat water through the same number of degrees. Water boils at 212 degrees Fahr., and creosote at from 200 to 225 degrees Centigrade. This would be the equal of from 392 to 427 degrees Fahr. In the Fahrenheit scale the freezing point of water is taken at 32 degrees and the boiling point at 212 degrees. In the Centigrade scale the freezing point is taken at 0 degrees, or zero, and the boiling point at 100 degrees.

There are but very few published records of experiments concerning the heating of creosote. Perhaps by comparison with the requirements for heating water we may reach a satisfactory conclusion. To heat 700 gallons of water per hour through 130 degrees (180—50=130) would require the expenditure of 758,333 heat units. 700x8⅓ (pounds per gallon) x 130 =758,333.

From coal of average good quality about 8,000 B. t. u. are available for actual heating from each pound consumed; therefore, if the coal was burned at the rate of 5 pounds per sq. ft. of grate per hour, 8,000x5, or 40,000, would represent the number of heat units available from each sq. ft. of grate. 758,333÷40,000=18.9, or practically 20 sq. ft. which is the grate surface required. If the rate of combustion is increased to 10 pounds per sq. ft. per hour a boiler having 10 sq. ft. of grate would be required.

To change the requirements from Fahrenheit to Centigrade, consider that 50 degrees Fahr., the temperature of the cold creosote equals 10 degrees Centigrade, and that 180 degrees Fahr. equals 82 degrees Centigrade. The creosote must therefore be heated through 72 degrees Centigrade (82—10=72) and 72 degrees on the Centigrade scale equals 162 degrees of the Fahrenheit scale.

To heat 700 gallons per hour, using the method of figuring given above, will require the expenditure of 700×8⅓×162 or 954,000 heat units. At a 5-pound rate of combustion a boiler having 23.6 sq. ft. of grate will be required, or at a 10-pound rate one having practically 12 sq. ft. in size.

As to the probable corrosion of the inner surfaces of the boiler, or the possible clogging of the pipes, we are unable to advise. Fig. 1 illustrates the sketch submitted. Several thousand gallons of creosote, having a temperature of about 50 degrees, is stored in a tank. A compressed air pressure of 10 pounds is placed on this tank to force the liquid through the heating boiler and into the creosote treating tank. It is to be distributed at the rate of 700 gallons per hour and the boiler is to heat the solution from 50 to 180 degrees. It is forced through a perforated pipe located at the top of the distributing or creosoting tank in which the wood posts or ties are piled. The liquid is not distributed evenly as the upper side of the ties or posts receive the bulk of the treatment, particularly those at the top of the pile.

The proposed method does not appear to us to be thoroughly practical. If the boiler proved to be effective in heating the creosote to the temperature required without corroding, the solution would be cooled quickly by spraying it upon the pile of posts. Large wood surfaces are sometimes treated by the spraying method but posts, ties, and similar lumber, is more frequently dipped.

Some of the railroads treat ties with hot creosote but use the open tank dipping process. The creosote is heated in a large open tank or trough, and the ties are immersed or dipped. They are allowed to remain in the solution a sufficient length of time to allow it to penetrate into the pores of the wood, the length of this period being from 30 to 45 minutes, according to how green or how well dried the lumber may be. Two men, one at either end of the tank, handle the ties with tongs similar to the tongs used in handling ice.

We should judge that it would be better to arrange the apparatus as for the open tank method. If it can be constructed in the open, in a position where a fire can be built under the tank, it can be set on piers made of fire brick. If this is not possible a steam coil can be placed in the bottom of the tank to heat the liquid. A small upright boiler can be used to supply the steam required. Some of the U. S. Government engineers use the latter method with good success.

WANTS ADVICE ABOUT HOT WATER HEATING SYSTEM.

Editor "Domestic Engineering":—Herewith you will find a sketch of a hot water heating job, or rather main risers from boiler. Kindly let me know what you think of the layout.

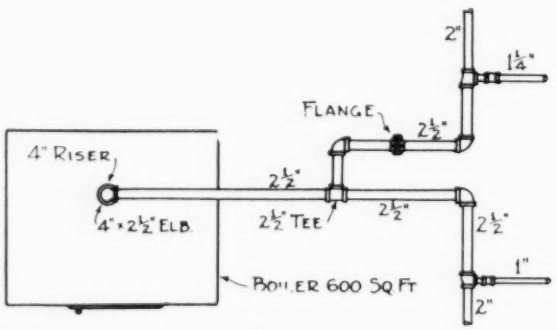


Fig. 1.

The owner claims he can't get heat. The radiation has not been checked. Of course I will do this, but I would like to get your opinion on this sketch as well.

Colorado. C. S. O.

It is rather a hard matter to pass upon the merits of a hot water piping system or layout when so little detail is given. In order to judge as to the capacity of the mains, branches, and risers; also the size of boiler required, a complete piping plan showing the connections to all radiators should be given, and the size of radiators and valves should be stated.

Fig. 1 is a reproduction of the sketch submitted. In addition to the information given in the letter, correspondent states that the return comes into the boiler in the same manner as the flow pipe shown; also, that the expansion tank is in the attic.

The sketch indicates to us the reason why the job does not circulate properly. Note that a 2½-inch flow main supplies two other mains of the same size. The area of a 2½-inch main is 4.78 sq. inches, and our correspondent is supplying two 2½-inch mains, area 9.56 sq. inches, with a pipe having but 4.78 sq inches of area. It can't be done.

Provided the branch connections are properly made, the area of a main should equal or exceed the combined area of all valves supplied by it. For example, if a main is to supply two radiators having 1¼-inch valves, area 1.22 sq. inches each, and two 1-inch valves area .78 sq. inch each, and one ¾-inch valve, area .44 sq. inch, the area of the main required is found by adding all of the valve areas; $(1.22\times2)+(.78\times2)+.44=4.44$ sq. inches. The area of a 2-inch pipe is only 3.36 sq. inches, therefore the next larger size of pipe is required which is 2½-inch, area 4.78 sq. inches. Begin to determine the size of the main at the point where the last radiator is connected. At this point it should be two pipe sizes larger than the branch supply to the radiator, then, working toward the boiler, add the valve area of each radiator connected, keeping the area of the pipe sufficient to supply all connections.

We call attention to this example so that correspondent may check his pipe sizes. The 4-inch pipe riser out of the boiler should supply a 4-inch main, and the main should continue this size to the point where it is divided to supply two 2½-inch mains. At this point a 4x2½x½-inch tee should be employed to divide the circulation.

If the boiler is the right size for the work, it would seem that the mains are fully large and could possibly be reduced in size. The footage of radiation on the job is not stated. The size of boiler is given as 600 sq. ft., therefore, provided the usual 50 per cent factor has been added, there should not be more than 400 sq. ft. of radiation on the job. If much more radiation than this amount has been connected, the boiler is undoubtedly too small for the work, if good economical service is expected from the plant.

A QUESTION ABOUT GREENHOUSE HEATING.

Editor "Domestic Engineering":—We have an inquiry about the relative heating value of the following layout of a forced system of hot water circulation for greenhouse work.

The houses are 170 ft. long and are now heated by means of six 1¼-inch pipes each 170 ft. long, continuous flow; using 1¼-inch open pattern return bends.

It is the intention to install four 1½-inch pipes, each 170 ft. long with open pattern return bends in the new houses, and we would ask your opinion as to whether the heating value in the 1½-inch lines (which in this case is 680 lineal ft., having a combined area of 1,348 sq. inches) will offset the 1¼-inch pipes which are 1,020 ft. in length, having a combined area of 1,525 sq. inches.

We have figured the water temperature at 180 degrees standing in still air at 65 degrees with no change in the pump speed; but do not know the actual loss in temperature of water after traveling through 1,020 lineal ft. of 1¼-inch pipe. Is it possible that the higher water temperature which can be maintained in the shorter 1½-inch coils would overcome the 1¼-inch coils and supply a relative amount of heat?

Ohio. A. L. W.

As nothing is said to the contrary in the above communication, we assume that the greenhouses now constructed are sufficiently warmed by 1,020 lineal ft. of 1¼-inch pipe coil, with the water entering the coil at a temperature of 180 degrees Fahr. This being the case, the radiating surface in each of the coils is $1,020\times.434$ or 443 sq. ft. Correspondent does not give the temperature of the return water. The actual velocity of the flow is, of course, governed by the speed at which the pump is operated and this is not given. For good service the drop in water temperature should not be over 20 degrees, and in extreme conditions the return circulation should be lower than 150 degrees.

If the new houses are of the same area, glass surface,

etc., as the old houses, and require the maintenance of the same inside temperature, which we infer is 65 degrees F., four 1½-inch pipes in a coil 170 ft. long, or 680 lineal ft. of 1½ inch pipe, will not give the required temperature, the pump speed remaining the same. The amount of surface in 680 lineal ft. of 1½-inch pipe is 336 sq. ft. This is about 25 per cent less than the surface in each of the coils in the old houses.

The difference in the frictional resistance to the flow can be figured for each type of coil theoretically, but in practice this figure may vary 15 or 20 per cent. The difference is not sufficiently great to allow of any very great reduction in the sq. ft. of heating surface, and we advise that the coils, if made of 1½-inch pipe, be constructed with five runs 170 ft. long. This will give 420 sq. ft. of surface in each coil.

INFORMATION ABOUT HEATING SHOW WINDOWS AND THE FRONT OF A STORE.

Editor "Domestic Engineering":—Why do heating engineers never put a radiator in a show window? I have been figuring a job with show windows as shown in the accompanying sketch, Fig. 1, and I thought that I could install a radiator by cutting a hole in the top of the partition. This would allow the heat to ascend and then heat the front of the store.

Ohio. P. H.

The show window space of a store is usually separated from the store proper by a wood partition or inside window which closes the space, and therefore is seldom heated.

An exception is made in cases where trouble is experienced from frost collecting upon the windows, thus obstructing the view of the window display from the street. In such cases coils are frequently installed below the bulkhead of the window, or a single run of pipe is carried across the space below the glass where it will not obstruct the view.

A plan of the method suggested by correspondent is shown by Fig. 1, which is a reproduction of his sketch. We do not

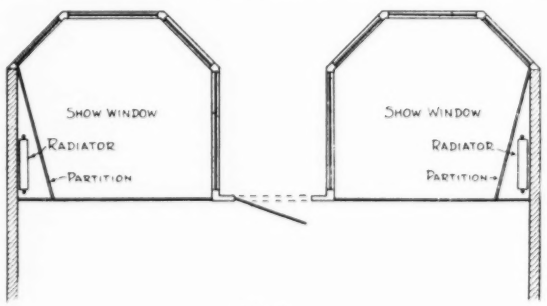


Fig. 1.

think that the method outlined would prove practical. Window space is valuable, and therefore any reduction in the area of the display space would be a serious objection. There is a still more important reason why the method should not be used. Without a circulation of air in sufficient quantity to the radiators they would not prove effective, and any opening in partitions would allow dust to settle on the display, a feature which every merchant tries to avoid.

If there is no partition or glass at the back of the windows (between them and the store space), and so much glass surface interferes with the proper heating of the store, it will be better to construct partitions or inside windows which will separate the window space from the store. If the store depends upon the show windows for light it will be necessary to use windows rather than partitions.

REMEDY FOR WATER HAMMER IN COLD SUPPLY LINES.

Editor "Domestic Engineering":—The accompanying drawings, Figs. 1 and 2, are sketches of some water lines to which I connected a bath tub, lavatory, closet and sink. The dotted line is an old line which was installed several years ago, but the other lines are water lines I put in when I installed the fixtures. I am having trouble with water hammer and would like you to please tell me what is wrong with the piping. I have tightened all bibb washers, and have wedged around all the pipes until they are immovable, but still that knock is in them. It sounds like a check valve. I disconnected the pipe at the tub and plugged it and the noise stopped. But when I connected it again, the

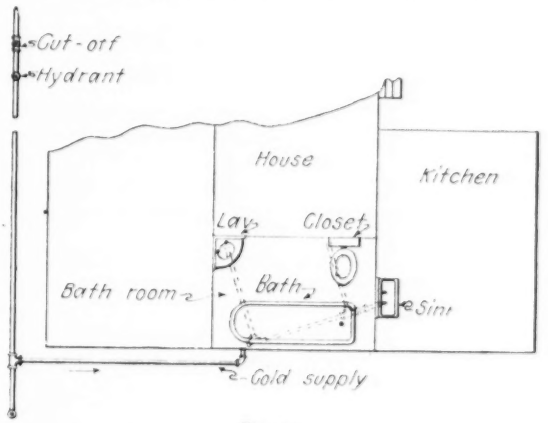


Fig. 1.

noise returned. Please explain the trouble at your earliest convenience.

Texas. A. G. L.

It appears that your trouble is due to water hammer. When a faucet in the bathroom is opened full, the water rushes quickly through the house main to the faucet. The quick closing of the faucet instantly stops the flow. But the water is rushing forward with great velocity and it has to spend its momentum on something when it is suddenly stopped. That something is the piping. The water which is incompressible, hits the piping with great force, as a hammer hits an anvil—consequently the noise.

To stop that noise you must insert some kind of means to bring the water to rest slowly. It must be cushioned, so to speak.

That can be done practically in two ways. One is to use slow closing valves, so that the water cannot be shut off suddenly. The other is to install an air chamber on the line so that the air will take up the force of momentum, by its own compression. The air is really a cushion, and you know you can hit a cushion with a hammer without making a noise.

You state that the noise stopped when you disconnected the branch to the bath and plugged it up. But in doing so you probably converted the bath branch into an air chamber without knowing about it, and that air chamber really stopped the noise.

When you re-connected the bath the air was drawn out, and of course the cushion was gone.

We advise you to insert a good sized air chamber somewhere on the line, preferably near the end. Make it large—say five feet of 1¼-inch pipe capped at the end. But be sure your air chamber is perfectly tight. Then we think the noise will be stopped.

Air chambers, in time, lose their air, even if they are

absolutely air tight. It is due to absorption of the air by the water under pressure.

A few drops of oil in the air chamber will deposit a film over the water and help prevent absorption.

When the air chamber loses its air—that is, when the water hammer returns, you can refill the chamber with air

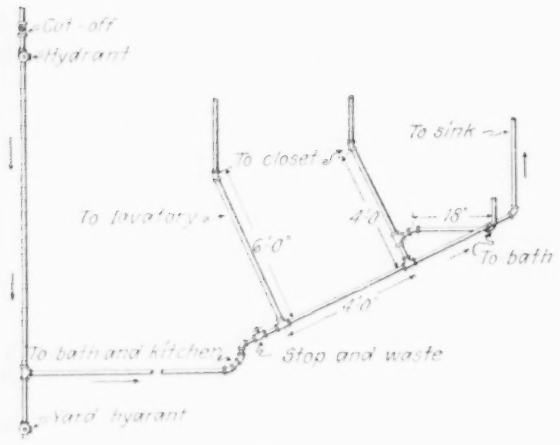


Fig. 2.

by shutting off the water, draining the line and turning on the water again.

We would like to ask you to write "Domestic Engineering" and let our readers know how you make out.

CONNECTING UP INSTANTANEOUS HEATER TO HOT SUPPLY FROM RANGE BOILER.

Editor "Domestic Engineering":—Fig. 1 is a sketch of a job I intend to install. How can I put an instantaneous automatic heater next to the boiler, taking the cold water supply to the heater from the 40-gallon boiler and connecting discharge or outlet of heater to hot water supplies for premises, without using any valves or making hot water from boiler pass through the heater in the winter time, when water is being heated by coil in furnace? What size of heater would you advise? Will such an arrangement work satisfactorily?

New York. F. G. H.

Probably the best way to connect up a heater for such service is to install a shut-off valve on the hot water line

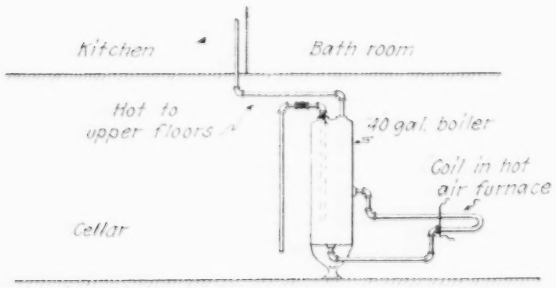


Fig. 1.

between inlet branch to gas heater and outlet branch from gas heater.

This valve would be shut during summer. Then the flow of water would be as follows: Cold supply enters range boiler. Cold leaves boiler through the hot supply line. It then passes down into the heater, where it becomes warmed automatically. The water, now hot, leaves heater, re-enters the hot supply line on the house side of the aforesaid valve, and flows direct to the fixtures.

During winter the valve on the hot supply line will be open and gas to gas heater must be shut off. Then all water is heated from the furnace only.

We advise you to communicate with the manufacturers of the instantaneous heater you have in mind, and get their book of instructions, for there are variations in the different heaters, which have to be considered in the installation.

REMEDY FOR LIME INCRUSTATION IN FURNACE COILS.

Editor "Domestic Engineering":—The water in this city is very hard and causes water fronts and coils to fill and clog very quickly. But some people seem to have more trouble than others. Some coils will last two or three years, while others will clog in two or three months. Coils of the same size and in the same kind of furnace differ that much.

Would it help any to keep the fire from coming in contact with the coils? What causes this difference?

I would like to get your opinon or any advice you may be able to give me—in your "Questions and Answers" columns of "Domestic Engineering."

Minnesota. M. W. R.

The cause of the incrustation is the lime, or other mineral, held in solution by the cold water. When the water is heated in the coils the line solution solidifies against the sides of the coils and ultimately clogs them.

Some clog quicker than others because they are subject to greater heat influences. The remedy is to neutralize the lime in the water before it enters the coil. There is an apparatus on the market for this purpose. You will see it advertised from time to time in "Domestic Engineering." It is a cylinder containing a compound and it is connected to the feed pipe to boiler or water back with valves. This device allows a harmless chemical to mix with the incoming water. This neutralizes the lime, causes it to precipitate, and allows it to be washed out at the sediment cock, instead of adhering to the walls of coil. We think you should use them in your vicinity.

Gas tractors to the number of 203,000, with a total value of $193,000,000; more than 1,000,000 plows, valued above $40,000,000; 225,000 farm wagons, valued at nearly $25,000,000, and 412,000 having machines, valued at about $25,000,000, were manufactured in the United States last year, according to detailed reports from 583 manufacturers summarized by the Federal Bureau of Public Roads. The total value of implements manufactured was $537,000,000 and gas tractors constituted more than one-third of the total.

Three United States patents on the manufacture of scienium oxychloride were recently granted to Dr. Victor Lenher, professor of chemistry at the University of Wisconsin. The chemical is now being manufactured on a commercial scale. The discovery of selenium oxychloride, which is the most powerful solvent now known to science, was first announced by Dr. Lenher at the St. Louis meeting of the American Chemical Society in April, 1920. Several post-graduate students have enrolled at the university to study the solvent.

Almost Too Generous.

Nurse—"Why, Bobby, you selfish little boy! Why didn't you give your sister a piece of your apple?"

Bobby—"I gave her the seeds. She can plant 'em and have a whole orchard."

How *to* Sell Electrical Equipment *to the* Farmer

Pointers for Plumbing and Heating Contractors on How to Conduct Successful Electrical Departments

By C. Hill Griffith

Director of Publicity for the Society for Electrical Development

IN the sale of electrical equipment, such as farm light and power plants, electrical water supply systems and the like, fully as much technical training and knowledge is required as in the sale of a modern heating system or a plumbing installation. This statement is not made in an attempt to discourage plumbing and heating contractors from taking up the installation of electric light and power plants and water systems, but it is made to impress upon such contractors the importance of making certain that the electrical equipment, which they sell, is properly set up and intelligently taken care of after the installation has been made. The field is technical and one should not attempt to enter it without the necessary background of training and experience.

Many Plumbing and Heating Contractors Have Successful Electrical Departments.

I have had electrical engineering experience and have had considerable practical experience in making electrical installations. As has happened in other instances, I once had the desire to tackle some amateur plumbing work. My advice now, to one not trained in the technicalities of the plumber's profession who would make a similar attempt, is "don't." I have gained a great deal of respect for the skill and knowledge of the plumber. I have also seen men with a mechanical bent tackle electrical work. They were not electrically trained and the results of their adventures were perhaps even more disastrous than my venture into the plumbing field. Nevertheless there are many plumbing and heating contractors who have successfully added an electrical department to their business, but in the majority of cases this branch is in charge of a skilled electrical engineer or contractor. To be really successful it must be so.

Electrical machinery for farm use requires first of all that it be installed properly; then it must be serviced. Electrical farm equipment is no more infallible in its operation than a heating plant; both require occasional expert attention. The sale is only partly made therefore, when the installation is turned over to the customer; you must keep it sold, and to keep it sold it is necessary that it be kept in proper working order at all times. That is what I mean by service.

How To Sell.

My advice to those who would sell electrical equipment to the farmer, or for that matter, to those who would sell electrical equipment of any kind to anybody, is to "sell the idea" first. An electric water system on the farm offers a definite service. It gives the farmer and his family the convenience of water in the house and in the barns. That is what you have to sell him.

An electric farm light and power plant provides the convenience of light, of power for household appliances and for driving the many machines necessary in the modern business of farming. It offers him a definite economy in performing the many operations on his farm. It is the idea of comfort, convenience and the economy that you must sell.

Sell the Idea First, Then the Equipment.

I have purposely made the positive statement that you must "sell the idea" because I want to impress that upon you with all the emphasis at my command. But after you have sold the idea in the case of the farmer, you will also have to sell the actual mechanical-electrical device which provides him with running water and the actual machine of iron, copper and batteries which provides the light and power for his farm. The farmer as a rule knows much more about machinery than his city cousin. He will be interested in many of the intricacies of this equipment, and you will find that he will quickly grasp the mechanical and electrical features of your machine. Remember he has been in the habit of buying machinery—harvesting machinery, dairy machinery and all of the dozens of different mechanical devices which are today making the farmer a mechanic. This leads us to the deduction that the man who would sell him must know his product thoroughly.

Your farmer prospects are not all from Missouri. Nevertheless, they all must be shown. They want to be shown what your machine has done, they are interested in the experience of others particularly in the experience of men whom they know.

Making Sales By Demonstration.

One of the best ways to show a farmer the value of your product is by demonstration. Some of the most successful salesmen of farm machinery depend largely on demonstrations to arouse interest and make sales. When a manufacturer puts out a new corn cutter, he arranges demonstrations to arouse the interest of the farmer and, by way of showing him what the machine will do, harvests a part of his crop. The community for miles around is circularized, letters are sent out, and every effort is made to stir up interest. Neighbors are urged to attend the demonstration. Then a good man, or several men, are sent out to conduct the show and to get prospects lined up.

I have been on farms and have attended these demonstrations and know that they are always interesting. I have seen dozens of farmers follow a new harvesting machine through the fields watching its every move. I have heard the questions put to the demonstrator, and they were mighty intelligent questions too.

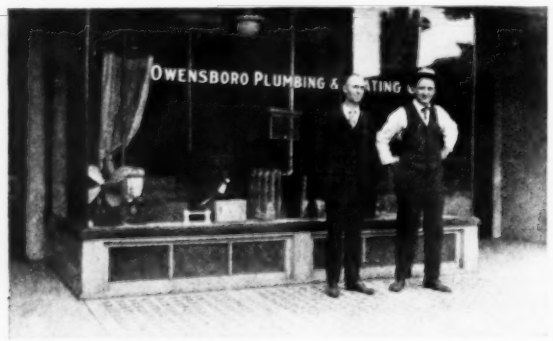
If you would make a success of the sale of electrical equipment to the farmer, you must go after his business in

the same manner. Set up a plant on a truck and take it on a tour of the countryside. Show what it will do and be prepared to answer questions. Do not think for a minute that you can get away with it by bluffing or dodging the issue. Your farmer prospect is a keen buyer particularly when it comes to purchasing anything to be used in his business of farming.

How to Advertise.

To sell economically one must advertise. This rule applies to the sale of farm equipment just as it applies to the sale of shoes and automobiles. The manufacturers of the product which you handle, can give you the most valuable help in this respect. Practically all of the manufacturers of farm light and power plants and of electric water systems have prepared very complete advertising material in the shape of descriptive circulars, testimonials, envelope enclosures and sales letters. Use this material and use it intelligently; it has been prepared by men who appreciate your selling difficulties and who understand the farmers point of view.

The mail will be one of your best carriers of advertising literature. The farmer gives his maid far more attention than the average city man. Furthermore he reads sales letters and will read long ones too. The mistake has been made of making a letter to a farmer too short and too much too the point. This sort of a letter appeals to the busy business man in the city but the farmer would prefer having more details. Mail order houses can give some good pointers on the matter of writing sales letters to the farmer. Very often their letters are two and even three pages in length, and, if you have observed the farmer when he gets his you have seen him put on his specks, unfold the letter carefully and deliberately and settle down to read and digest the contents thoroughly.



Show Window of the Owensboro Plumbing & Heating Co. in Owensboro, Ky., Featuring Electrical Appliances.

Selling Tactics.

When you get down to the actual selling arguments, you must also handle your prospect in a different manner than you would handle other types of business men. You cannot hurry the farmer. He wants plenty of time to deliberate and, if at all interested, wants to know the minute details of your proposition.

In your approach you must not overlook the farmer's family. Be particularly diplomatic in your treatment of his wife. She is directly concerned with the product which you are selling and very often, if she can be convinced, the sale will follow with little difficulty. Also remember that she often holds the purse strings.

Most successful salesmen of farm equipment are ever on the alert to grasp apparently unimportant instances and will bring them to bear in clinching the sale. A casual remark that the farmer's wife suffers from rheumatism may well suggest the argument that the electric pumping system will remove the necessity of her carrying water from the well The fear of slipping on the cellar stairs while carrying a lighted lamp gives you the best possible argument for the installation of a lighting system.

Endeavor, too, to learn the particular hobbies of the farmer and his family. A casual remark that the wife is interested in raising chickens opens the door to many excellent selling arguments. I know of one case where the sale of a light and power plant was clinched by the suggestion that it could provide light in the chicken houses so that the hens would lay overtime.

It would be possible for me to continue at great length pointing out ways of arousing the farmer's interest, but the best advice one can give, I believe, is this: Study your prospect, learn to appreciate his point of view, and then show him that what you have to sell is what he needs to make his farm more profitable and his home more comfortable and convenient.

CONSTRUCTION INDUSTRY NOW IS REVIVING.

The general rule of business revival, deduced from careful study of many periods of depression and prosperity, is that the business which first suffers depression is the first to revive. The clothing industry was one of the first to suffer in the United States and it will be the first to revive; indeed it now is reviving, says "The American Contractor".

The construction industry was forcibly depressed—suppressed, perhaps, is better—during the war and by all rules of priority and by the completeness of the depression, the construction industry should have been the first to work its way back to normal conditions. The revival of 1919-1920 was as abnormal as was the suppression in 1917-1918 and only deferred sound and permanent progress to a new level of activities in harmony with the profound economic changes of a reconstruction period. The growth of building activities since February of this year appears to be rising tide of construction revival which was the logical sequence of the low tide of 1917-1918 and it is more a reason for congratulation than for protest that the tide has come in so slowly

It is worthy of reflection, also, that some one basic industry may function on a level of comparatively satisfactory activity even in the face of a general depression. That is now the situation as regards the construction industry. Despite all the wry-faces, the construction industry now is more active than most industries and, insofar as it meets housing demands and requirements of transportation systems and public works, there is no reason why it should not continue in this more favorable position.

Parkersburg, W. Va.—The Nelson Plumbing Co. has purchased the business and stock of the Stansbury Plumbing Co., and both stores will be operated under the name of the Nelson Plumbing Co. Mr. Stansbury retires from business.

J. W. Lindsay of 1341 Elm Street, Manchester, N. H., has the contract for plumbing and heating in a $30,000 residence to be erected at Bedford, N. H., for Mrs. Edith A. Jones of New York.

Construction of the $150,000 state school for the deaf at Tucson, Ariz., will probably begin in August. Full working plans have been completed by Lyman & Place, architects, Tucson. Four buildings are to be erected. A heating plant will deliver hot water for heating and other purposes. Water will be pumped from a well on the site into a large storage tank.

LEGAL QUESTIONNAIRE

*Has a Non-Licensed Plumber a Legal Right to Do Plumbing Work Under the Supervision of a Licensed Plumber in States Requiring Licenses?—This Question is Answered in a Most Careful Manner**

By "The Judge"

Is It Legal for Non-Licensed Plumber to do Plumbing Work Under Supervision of Licensed Plumber in States Requiring Licenses?

Editor "Domestic Engineering":—Owing to a strike in the building trades in our city it has been become necessary for master plumbers to employ plumbers helpers to assist licensed journeymen plumbers. In Massachusetts the law requires that a journeyman plumber must take a state examination and be licensed. My firm has been employing plumber's helpers to do work with licensed plumbers and the plumbing inspector claims that under the law the helper can do no work himself, which is subject to inspection, even if he is working with a licensed plumber. Are we right or is the plumbing inspector right?

Massachusetts. F. V. G.

Answer:—If your plumber's helper is used as a bona fide helper, and works under the *immediate supervision* of a licensed journeyman plumber, in my opinion, you are within the law. There has been no case decided in your state by the court of last resort touching upon this particular point, but a test case was recently decided in one of the lower courts, the decision being that a non-licensed plumber's helper can do work at plumbing which is subject to inspection if the helper is working under the immediate supervision of a licensed plumber.

It is easy to see that this ruling might be otherwise in cases in which the master plumber is trying to evade the law, and really uses an experienced helper to do plumbing work subject to inspection without actual and immediate supervision of a licensed plumber. For instance, it would be open to serious question whether the helper could be used to run a stack of pipe in one part of a new building while the licensed plumber was at work in the cellar doing other work, even though the licensed plumber should occasionally inspect the work which was being performed by the helper. The helper must be a bona fide helper, working under the immediate supervision of the licensed man. He probably could work upon one section of a stack of pipe while the licensed plumber was at work on another section of it; but he must be actually helping the licensed man.

The only case decided in your state on facts anywhere near those outlined above, was a case in which a master plumber employed several non-licensed plumbers whom he put to work in different places and then visited the various jobs, laid out the work, inspected it, and had general supervision of all of them. In this particular case, too, the work done by the non-licensed man was later inspected by the city inspector and passed as all right. In that case the Supreme Court held that the non-licensed man was guilty of a breach of the law and that he was doing plumbing work which was subject to inspection. But the court also made some pertinent remarks which would lead to the conclusion that the non-licensed plumber would not have been guilty under different circumstances, even if he were engaged upon work which was subject to inspection. The court said:

"It is now urged that the defendant might have been found working as an apprentice, or under the *immediate supervision* of a journeyman plumber. But the evidence would not warrant such a finding."

While this is not a positive and unequivocal declaration of the law, it nevertheless supports the inference that if the non-licensed man had been working under the immediate supervision of a licensed plumber, he would not have been found guilty.

The statute in your state covering the matter of licensing of journeymen plumbers contains the following provisions:

"A journeyman plumber is a person who himself does any work in plumbing subject to inspection under any law, ordinance, by-law, rule or regulation."

"No person shall engage in the business of a master plumber or work as a journeyman unless he has been licensed by the examiners as provided in this chapter."

The provisions of the statute above quoted, taken by themselves, without reference to other sections of the statute, would seem, on the face of it, to prevent a helper from doing any work subject to inspection, particularly the words: "A journeyman plumber is a person who *himself* does any work in plumbing. . ." But other provisions of the statute, to which I shall refer, take away some of the apparent narrowness of the above words; at any rate, the court in the test case above mentioned, we believed that the other provisions controlled these narrow restrictions.

One of the other sections of the statute which would seem to broaden the law reads that the prohibitive sections shall "apply to all persons learning the business of plumbing when they are sent out to do the work of a journeyman." This section would seem to mean that a person learning the business of plumbing need not have a license unless he is sent out as a journeyman. In other words, if he is sent out as a boni fide helper, under the immediate supervision of the licensed plumber, the prohibitive sections of the law shall not apply. Unless this interpretation is put upon this section, it would be superfluous.

Another section of the statute which would appear to say that the state legislature intended that plumbers who have not passed the examination might do work subject to inspection, provides that "The examiners may, without payment of any fee, issue a probationary license in force for six months to a person who, having worked as an apprentice, or under a verbal agreement for instruction, for not

*Every Effort is made to the End that these Answers may be authoritative. However, we cannot assume any Responsibility because of the Very Nature of the Service, which is rendered without a personal interview.—Editor.

less than three years, presents an application therefor with the signed endorsement of his employer agreeing to be responsible for all work done under the license and to have the licensee, at the expiration of the license, present himself for examination as a journeyman."

The above provision certainly provides that a plumber who has not received a regular journeyman's license, may work at plumbing, for it specifically says that after six months he shall take the examination.

Another argument against the position taken by the inspector in your case, that no person can do plumbing work subject to inspection without a license, is based upon the fact that the law provides that the examination which the plumber is required to take before receiving his license shall include a practical test. The rules laid down by the examiners also provide for such a test. It was argued in the test case above mentioned, and appeared to have considerable weight with the trial judge, that the legislature could not reasonably have provided that an applicant for a license should be subjected to a practical test with the tools, and at the same time prevent him from lawfully securing the experience by actual work under certain conditions.

In rendering the decision in the test case to which I have referred, the trial judge remarked that he did not see how a plumber could secure the necessary experience and practical working ability unless he should be allowed to work with the tools under proper safeguards. The judge also remarked that the health of the general public, to safeguard which the law was enacted, would be amply protected if the work done by a non-licensed man was performed under the immediate supervision of a licensed plumber.

While the test case mentioned has not the force of a decision of the Supreme Court of your state, it nevertheless substantiates the opinion of the Judge that a plumbing inspector cannot lawfully prevent a helper from doing plumbing work under the immediate supervision of a licensed plumber. In some cities which require inspection of plumbing the city solicitors have ruled that one licensed plumber on a job is sufficient to enable several non-licensed plumbers to work on the same job under the law. As the sole purpose of the law is to protect the public health, and as those towns and cities in which the law applies require an inspection of the work done by a city authority of the work done, inspectors who refuse to permit a non-licensed man to assist a licensed man are certainly taking an extreme position.

In the test case referred to, the evidence showed that the non-licensed man was calking soil pipe and that the licensed plumber under whose supervision he was working, was absent from the spot where the non-licensed man was working from time to time, but not for very long at a time It was held that mere absence for a few minutes at a time did not prevent the non-licensed man from being under the immediate supervision of the licensed plumber.

GETTING PAID FOR EXTRA WORK.

Lack of evidence that additional work has been ordered on a contract makes it difficult for the plumbing or heating contractor to collect. For this reason, Walter Christensen & Co., of Mason City, Iowa, protects himself by having the customer fill out the form shown herewith. This is made out in duplicate, the customer getting one, the other remaining in Mr. Christensen's office. This has been found satisfactory to all parties and is passed along for the benefit of readers of "Domestic Engineering."

Mr. Christensen conducts a progressing plumbing and heating establishment and finds that it pays to have price tags on the fixtures displayed in his showroom. It is a matter of record that his bookkeeper and stenographer has made many sales during his absence from the office, as a result of this idea.

The front of the vacant lot adjoining Mr. Christensen's shop is covered with a large sign, painted in colors, calling attention to the shop next door and the kind of supplies carried.

Order For Extra Work.

Date.....192.....

I herein order the following labor and material installed at my building now under construction at.....

.....

EXTRA LABOR AND MATERIAL

.....

.....

.....

.....

.....

.....

.....

.....

Price Made $.....

The above prices are to be charged over and above the contract which I now have with.....

Signed .....

Owner

Signed .....

Contractor

The Plumbing and Heating Establishment of W. Christensen & Co., Mason City, Iowa.

J. Alfred Auger has opened a new plumbing and heating establishment at 26 Bradbury Street, Biddeford, Me.

News of the Associations

St. Lou's Master Plumbers Hold Annual Outing.

On Saturday, July 23rd, the members of the St. Louis Masterer Plumbers' Association and their friends, including journeymen plumbers, city plumbing inspectors and supply house representatives, held their annual outing and basket picnic at Mueller's Park in that city. Mueller's Park is an attractive picnic and amusement ground and afforded a continuous round of amusement for the more than a thousand attending.

Aside from the park's merry-go-round, miniature railroad, dancing pavilion, etc., "Seb" Kierman, chairman of the entertainment committee and his associates, arranged for fifteen sporting events and contests which proved to be the heighth of enjoyment.

The contests started in the early afternoon with a baseball game between the Crane Co.'s nine and the aggregation of the N. O. Nelson Mfg. Co. The Crane nine held their opponents to one run, while the Nelson team allowed five runs to pass over the rubber in the seven innings of playing. The batteries for Crane were Roche and Casey, with Zoff and Applegate on the opposition.

Possibly the most exciting and most hazardous of the events that followed, which consisted of most every outdoor sport—from foot racing to horse shoe pitching—was the Roman Chariot Relay Race. In the absence of real chariots, wheelbarrows were used while master plumbers were drafted into service as horses and riders. It was indeed surprising to see how fast these chariots covered ground and how evenly matched the teams were. It took three trips over the fifty yard course to determine the winner of this event.

The program of contests was completed without a hitch and ended about six o'clock in the evening, after which the picnickers scattered out in small groups under the trees and disposed of the contents of their once filled lunch baskets. Those who did not bring food were abundantly provided for in the cafe, conducted in connection with the park, where a special fried chicken dinner was served.

Following the evening repast a little dancing was indulged in. And it was well toward midnight when the picnickers ended a perfect day.

Portland Craftsmen Hold Annual Outing.

About 40 members of the Portland Stove Dealers' Association, composed mostly of business men engaged also in plumbing and heating, and their ladies enjoyed the festivities of their annual outing July 19, at "Mitchell's" the famous clam-bake house at Spurwink, Cape Elizabeth, Me.

An excellent shore dinner was enjoyed, and there were all sorts of sports and contests from races to bean-guessing. The seven-mile trip from the city was made by automobiles.

The members and their guests were as follows:

Mr. and Mrs. W. T. Bradford, Mr. and Mrs. C. J. Tilton, Mr. and Mrs. C. O. Morton, Mr. and Mrs. L. H. Cummings, Mr. and Mrs. W. A. Allen, Mr. and Mrs. J. E. Weeks, Mr. and Mrs. F. E. Wheeler, Mr. and Mrs. F. X. Jannelle, Mr. and Mrs. A. G. Spinney, Mr. and Mrs. E. A. Willard, Mr and Mrs. A. F. Hatch, Mr. and Mrs. Geo. W. Cutts, Mr. and Mrs. J. W. Knight, Mr. and Mrs. W. E. Allen, Mr. and Mrs. Wm. H. McBrady, Wm. H. McBrady Jr., Elizabeth McBrady, Wm. J. Curran, Beatrice Curran, Katie Chadbourne, Belle B. Tilton, E. A. Wheeler.

Snapshots taken at the annual Outing of the St. Louis Master Plumbers' Association. Top row, left to right: A. Stein, Miss Mock, William Kuehne, Miss Wininger, J. H. Noll, and W. F. Stein, D. J. Callahan, Mrs. "Seb" A. Kiernan, "Seb" A. Kiernan, chairman of the entertainment committee, B. A. Conroy, secretary-treasurer of the D. & T. Mfg. Co., St. Louis, Mo.; R. K. Milward, manager of the St. Louis branch of the U. S. Radiator Corporation; Joseph R. Knapp, Standard Sanitary Mfg. Co.; W. H. Peepels, manager of the St. Louis branch of the W. G. Cornell Co., New York. Center, left to right: Henry F. Ryffel, president of the St. Louis Master Plumbers' Association, and J. B. Moore and their families. Four members of the N. O. Nelson Mfg. Co.'s general offices. Back row, left to right, A. A. Zertanna, W. L. Gourley, Ruud Mfg. Co.; D. J. Collins, Robert Thompson, Humphrey Co.; front row: Mrs. Hartner, three members of the Collins family and Mrs. D. J. Collins. Bottom row, left to right: J. R. Calhoun, Standard Sanitary Mfg. Co.; J. A. Schellar, Wolff Mfg. Co.; William Stamm, N. O. Nelson Mfg. Co., R. H. Rebele, Standard Sanitary Mfg. Co.; A. B. Pierce, N. O. Nelson Mfg. Co. Ladies' Clothes Pin Race. S. Duncan, Miss Kehoe, E. H. Isreal, Miss Brown, Wayne Warden, manager of the East St. Louis Branch of the Standard Sanitary Mfg. Co., while the others are members of the St. Louis Branch of the Company.

Various races and contests furnished exercise and glory for contestants, and amusement and excitement for the spectators. The wheel-barrow race, always the source of much fun, was won by Mrs. McBrady, who received a piece of cut glass for her efforts, while Ernest A. Wheeler of F. & C. B. Nash, got a smoking set for prowess in the same event.

A peanut contest was won by E. A. Willard, the prize being a flashlight. Mrs. Fred E. Wheeler, wife of the Woodfords plumber, won a percolator in the marshmallow contest, while E. A. Willard demonstrated his versatility by again being crowned champion, this time of a piping contest, for which he received a safety razor.

John Knight of Knight Bros., Westbrook, received a nickel plated sponge rack for winning a shoe race, and Miss Belle Tilton got a nickel plated tea kettle.

The nail-driving contest was captured by Mrs. Spinney, who was awarded a rug for a prize. Mrs. Jannelle was given a pitcher for her efforts. The guessing contest was close, beans in a bottle furnishing inspiration for counts. Mrs. Hatch and John Knight each guessed there were 425 beans, whereas there were 411, and were awarded a picture and globe, respectively.

Mrs. Cummings won a thread-winding contest, receiving as a prize a toaster and lighter. Arthur Hatch and W. A. Bradford captured cigars for efficiency in button-sewing.

New Mexico Plumbing and Heating Contractors Organize.

A state organization of New Mexico master plumbers and heating contractors was inaugurated in Albuquerque last week when members of plumbing and heating firms throughout the state met in convention in that city. The association will be known as the New Mexico Sanitary and Heating Engineers. Convention sessions were held in the morning, afternoon and evening in the Woman's Club building, with J. J. Kelling, of the Colorado Heating and Sanitary Engineers, as guest of honor. Mr. Kelling was especially requested to attend the meeting and propound his ideas. In a forceful address, he impressed the sanitarians with the need of devoting skill to the profession as well as to individual interest and urged them to be alert to health and sanitary regulations of their localities and state. Speaking of the need of plumbing regulations and the recent Pueblo, Colo., flood, Mr. Kelling said:

"You know when houses are safe to live in or dangerous to live in by reason of perfect or faulty sanitation. Use your knowledge not only to gain a livelihood, but to protect and to warn people from disease and death. Be sure your city has stringent rules governing the plumbing of houses, and by all means work for strict enforcement of the code after you have examined and endorsed its adoption. Dignify the profession of the sanitarian by being leaders in civic reforms and health crusades. Do you know that when the flood waters of Pueblo receded that the very first measures taken to safeguard the health of the people was to send a squad of sanitarians all over the city to inspect and repair the plumbing of the buildings?"

A motor drive and dinner at the home of N. J. Strumquist, who presided as chairman pro tem., were entertainment features of the convention.

Officers elected to serve for the ensuing year were:

President, Charles L. Chamberlain, Santa Fe; vice-president, J. H. Peak, Albuquerque; secretary, N. J. Strumquist, Albuquerque; treasurer, A. L. Staehlin, Albuquerque. Board of Managers, W. J. Beauchamp, A. L. Staehlin, Albuquerque, A. T. Chamberlain, Raton; J. Grant, Magdalena.

Jersey Master Plumbers To Hold Outing in Maplewood.

The Master Plumbers' Association of Jersey City, N. J., will hold its annual outing at Doerr's Union Park, Maplewood, N. J., Saturday, September 10. The trip will be made by automobiles furnished by members of the association, and it is expected to have a good delegation of out-of-town plumbers and representatives of manufacturers and jobbers. Coupled with the games and contests to be held, two excellent meals are on schedule, one to be served the earlier part of the day and one the latter part. The committee in charge of the outing consists of Henry A. Cohendet, Chairman; John J. Corcoran, John T. Edge, Morris Fellerman, James T. Brennan and Alexander G. McIntyre.

Trade Extension in New England.

The mid-summer heated spell has had no effect on the work of Daniel L. Hanson, National Trade Extension Bureau representative in New England. In fact, July was one of the busiest months that Mr. Hanson has put in, much of the time being devoted to individual talks with master plumbers at their shops or offices. He started out after the holiday and spent several days in Gardner, Holyoke, Northampton, Easthampton and Westfield.

A trip through Vermont was planned for the week of July 11, but Mr. Hanson got no farther than Brattleboro, Vt., when a cloudburst cut off all roads and obliged him to abandon the trip. Instead he crossed into New Hampshire and carried on his missionary work in Keene, Hillsboro, Concord, Manchester and Nashua.

On the afternoon of the fifteenth, Mr. Hanson addressed a gathering of master plumbers at Gardner, Mass., discussing the various phases of salesmanship which have proven of value to the industry. He urged particularly that the plumber take the public into his confidence. "Remember," he said, "the small number of customers each of you can get forms only a small proportion of the people in your town. Having their goodwill is not enough. We must get the goodwill of the public as a whole—that something which is called prestige—another name being power."

The Gardner association is making plans to take up the National Trade Extension Bureau lecture course in the fall.

The Start of the Roman Chariot Relay Race, at St. Louis Master Plumbers' Outing.

Front Row, left to right: R. A. Dubuque, Dubuque Supply Co.; J. M. O'Shea, Wolff Mfg. Co.; L. P. Leahy, Crane Co.; J. J. Shea, Peerless Selling Co., Evansville, Ind. Rear: F. P. Applegate and C. Elmer Meyer, both of Crane Co.—From Photo taken at St. Louis Master Plumbers' Outing.—See preceding page!

AMONG THE WHOLESALERS AND MANUFACTURERS

COMPANIES RECENTLY INCORPORATED.

The Silentflush Valve Mfg. Co., Springfield, Mass., recently organized with a capital of $300,000, has taken out a charter. The officers of this company are Arthur W. Morris, president, and Robert M. Keating, treasurer.

The Moore Patents Corporation, New York, N. Y., has been incorporated with a capital of $500,000 to manufacture pipe, pipe fittings, plumbing fixtures, etc. The incorporators are G. W. Moore, S. Dressler and A. Berres, and the company is represented by H. G. Littau, 391 East 149th Street, New York.

The Sani Products Co., Lt., Toronto, Ontario, Canada, has been incorporated with a capital stock of $40,000 to manufacture sanitary metal and wood products. The incorporators are John S. Dugan, Willis B. Sturrup, and Thomas S. H. Giles, and others.

TO IMPROVE PLANT.

The N. O. Nelson Mfg. Co., St. Louis, Mo., is having plans prepared for the construction of extensions and for general improvements in its plant at Noblesville, Ind. The cost of these improvements is estimated at $50,000.

IN NEW LOCATION.

The M. J. Dougherty Co., Philadelphia, has moved its plant to new quarters on Washington Avenue in that city, occupying the block from Twenty-fourth to Twenty-fifth Street. Increased fabricating and production facilities are provided in the new location.

SLOAN VALVE CO. OPENS CANADIAN BRANCH.

The Sloan Valve Co., Chicago, has recently opened The Sloan Valve Co., Ltd., in Toronto, Canada, a branch of the Chicago company, which will manufacture and distribute the company's products throughout the Dominion. The factory, warehouse and office of the Canadian company are located at 67 Adelaide Street, East, Toronto, Ontario. C. E. Sloan is manager of the new branch.

BUYS SILICA LAND.

The Louisville Division of the Standard Sanitary Mfg. Co., of Pittsburgh, Pa., has purchased for $5,000 fifteen acres of land at Eastview, Hardin County, Ky., where there is an excellent deposit of Silica, or moulding sand, which the company uses in its foundries at Louisville and elsewhere.

ORGANIZING COMPANY.

Charles B. Kuhns and George A. Kuhns, Shamokin, Pa., operating a works in that city under the name of Kuhns Brothers, are organizing the Pennsylvania Supply & Mfg. Co., in Allentown, Pa., to manufacture ventilators and similar metal products. The new company will be located at Church and Chestnut streets, Allentown, where 15,000 square feet of floor space have been acquired.

NEW ADDITIONS AND IMPROVEMENTS.

The National Mill Supply Co., Fort Wayne, Ind., has recently equipped spacious offices on the second floor of its main building, where the offices of President E. W. Lehman, Secretary L. F. Lehman and General Manager S. A. Lehman will be located.

TO MOVE RECENTLY ACQUIRED BUSINESS.

The business of the Morgan Grinder Co., Worcester, Mass., formerly Churchill-Morgan-Crittsinger, Inc., recently acquired by the Greenfield Tap & Die Corporation, Greenfield, Mass., will immediately be moved to Greenfield, Mass. It was the original plan of the latter company to postpone removal until the fall.

OPENS OFFICE IN SEATTLE AS CENTRAL FOUNDRY REPRESENTATIVE.

Edgar L. Keithley, who until recently was connected with the Seattle Plumbing Supply Co., Seattle, Wash., has opened an office at 1323 Alaska Bldg., that city, as a representative of the Central Foundry Co., New York City. He will assist his father, who is the San Francisco representative for the same company. The territory to be covered will comprise Oregon, Washington, neighboring states and British Columbia.

THE CROP REPORTS PREDICT A GOOD HARVEST.

Reports show that the American farmer is harvesting, or will harvest an exceptionally good crop, which means plenty of food for this country, and a good supply for export. Late advices indicate good supply of rain in the Spring wheat section, and in the East, where it was badly needed.

Corn is looking exceptionally well. The cotton situation shows a decreased acreage, and only a fair condition, but southern authorities say this is a blessing this year, where it would be a calamity in other years. The short crop of this year will enhance the value of the cotton held over from last year. Here and there fruits have suffered from frost, but there will be a sufficient supply. There will be a plentiful supply of small grain.

In the Western sections of the country there has been an abundance of snow and rain, and all irrigation sections have a sufficient supply of water. The grazing lands in the mountain sections are in exceptionally fine shape. Live stock producers are confident that the market will continue to strengthen and that the worst has happened. Many farmers believe that the most promising market for the large amount of surplus feed is through feeding it to live stock. Dairy products are in good demand and prices on the whole are good.

There has been a sufficient supply of labor to plant and harvest this year's crop and at a much lower cost to the farmer. This year's crops were put in at minimum costs, many farmers co-operating in helping one another put in and harvest crops so as to save expense.

All in all, it looks like a bountiful crop from Florida to Washington and from Maine to California.

JULY MEET OF THE DELAWARE VALLEY TRADE GOLF ASSOCIATION.

The July Meet of the Delaware Valley Trade Golf Association was held at the Lu Lu Temple Country Club, Edge Hill, Montgomery County, Pa. Owing to the fact that a number of the members were taking their vacations, the number of players out was comparatively small. W. Culbert finished first in the morning round with a net card of 73. An excellent lunch was served in the club house after the morning round had been concluded. Ray Groff and W. H. Oliver succeeded in annexing the first prize in the afternonn round with a net score of 67. A lot of pep was exhibited throughout the afternoon best ball foursome and a number of good cards were turned in. W. H. Oliver, in the absence of the president, presided at the meeting which followed the supper, and announced that the next meeting of the Association will be held at the Trenton Country Club the third Tuesday in August, or the 16th. Each member present received two golf balls from the Association for attending.

Morning Round.

	Gross	Hdcp.	Net
Ward	101	22	79
Bolsinger	105	25	80
Turner	126	30	96
Culbert	92	19	73
Oliver		No Card	
Groff	115	28	87
Shaw (Guest)	94	22	72
Prenter (Guest)	107	25	82
Kleinman	91	13	78
Powers	108	17	91
Shelmerdine	115	35	80
Faherty	120	28	92
Webber	115	30	85
Bitzer	118	30	88
Newton	99	22	77
Brecht		No Card	
Lane (Guest)	88	10	78

Afternoon Play.

	Gross	Hdcp.	Net
Groff and Oliver	92	25	67
Shaw and Prenter	87	22	65
Kleinman and Powers	87	13	74
Newton and Ward	97	22	75
Shelmerdine and Turner	110	30	80
Bolsinger and Culbert	91	19	72
Bitzer and Faherty	104	28	76
Lane and Easton	84	10	74
Murray and Webber	103	27	76
Fogwell, alone	110	20	90

WESTERN TRADE GOLF ASSOCIATION HAS PLEASANT DAY AT RIDGEMOOR COUNTRY CLUB.

H. M. Algeo will soon be disputing Chick Evans' right to the title of Western champion, if he keeps up the progress in the grand old Scottish game of golf that he has shown in the past three months, during which time he has gone from winner of the Duffer's Cup on April 28th to winner of the Association Cup on July 22nd. On the latter date over forty members and guests of the Western Trade Golf Association met at the Ridgemoor Country Club. Clear skies and an excellent course resulted in some very good cards being turned in. S. Davidson Herron, national amateur champion of 1919, playing from scratch, brought in a 74, just one above par for the course, but Mr. Algeo with a gross of 101 and a handicap of 30 won the cup with a net of 71. Howard W. Evans, winner of the third flight, was runner-up for the association cup, with a net of 72. G. E. Lavelle with a net of 81 won the prize, a silver watch fob, for the best score among the guests. The beautiful and much coveted Duffer's Cup went to W. E. McCollum, who has long had designs on this hardware.

Photographs taken at the July Meet of the Delaware Valley Trade Golf Association.—At the top left is a group of the players at the score-keeper's table; in the center, Messrs. Bolsinger and Shelmerdine posing before putting for the fifth prize; at the right is H. Kleinman shooting for a "five". The bottom picture shows Messrs. Groff, Shaw, Prenter, Oliver and Brecht.

The morning qualifying round resulted in some very good scores. A. J. Miller and R. C. Flinder led with cards of 41, followed by E. M. Peters with a 43, Henry O'Callaghan with 45, E. W. Sanborn, R. Doherty, C. D. Little, and E. J. Claffey with a 46 each.

Following play, an excellent dinner was served at the Club House, at which the president, Bruce Fulton, provided a fund of humor and raillery as he announced the various winners, adding that the chief reason for his not winning a prize was his excellence at mathematics.

After the election of A. C. Brown, president of the Chicago Faucet Co., to membership in the Association and the announcement that in all probability the next meeting would be held at the Harlem Golf Club and include a barbecue, the directors of the Ridgemoor Country Club were given a unanimous vote of thanks for their efforts in making it a most enjoyable day.

Afternoon Play.

	Gross	Handicap	Net
S. D. Herron (Winner)	.....	.....	74
A. L. Miller	.....	.....	.....
H. P. Mason	89	12	77
Mr. Lloyd	.....	.....	86
E. W. Sanborn	107	17	90
C. D. Little (Winner)	93	15	78

H. M. Algeo, A. C. Brown and E. J. Claffey, Three of the Winners at Western Trade Golf Association's July Meet.

C. R. Elliott	114	26	88
L. B. Fulton	114	25	89
C. R. Crane	99	20	79
J. Roy Andrews	108	20	88
H. W. Evans (Winner)	97	25	72
C. S. Pitkin	104	26	78
H. A. Cross	112	30	82
E. J. Claffey (Winner)	97	22	75
R. Doherty	98	16	82
F. S. Crumley	105	22	83
Chas. E. Barrows	119	30	89
Mr. Ensign	99	.....	.....
Paul Blatchford	102	18	84
N. H. Blatchford (Winner)	107	24	83
A. S. Lindeblad (Winner)	110	30	80
Wm. Devine, Jr.	117	30	87
Peter Munn	117	30	87
O. Deschauer	123	30	95
H. M. Algeo (Association Cup)	101	30	71
W. E. McCollum (Duffer's Cup)	130	30	100
G. E. LeVelle (Guest Prize)	111	30	81
A. C. Brown (Winner)	119	30	89
W. J. Raymer	97	18	79
J. F. Carroll	99	18	81
W. A. Wickersham (Winner)	89	15	74
E. M. Peter	96	18	78
T. S. Parsons	108	30	78
H. O'Callaghan	96	18	78
R. C. Flinder (Winner)	98	22	76
P. Johnson	95	16	79
T. E. Merrill	94	16	78
J. A. Cook	107	24	83
T. P. Wade (Winner)	98	22	76
J. McAlear	113	30	83
H. M. Hart	114	30	84
F. P. Keeney (Winner)	111	30	81
H. P. Termansen	119	30	89

H. Price Whitaker, vice-president of the Whitaker-Glessner Co., Wheeling, W. Va., has been appointed a member of the West Virginia state highways commission by Governor Morgan, and has accepted the appointment.

Myron J. Glauber, of the Glauber Brass Mfg. Co., Cleveland, Ohio, who recently returned to Cleveland from an extended trip in the West and Northwest, reports business conditions in that part of the country as very favorable.

L. P. Berry, Jr., manager of the American Sanitary Sewage Co., Memphis, Tenn., was in Chicago this week on an extensive trip on which he will visit many of the leading cities in the North.

H. V. Linhard, formerly city salesman of Murray W. Sales & Co., Detroit, has been appointed sales manager of that company.

D. F. Stevenson, who has been associated with the American Radiator Co. in Detroit, is now connected with the Lowry Co., Atlanta, Ga.

H. D. Tulpin, formerly connected with the Park & McKay Co., has recently joined the sales force of the Anchor Pipe & Supply Co., Detroit, Mich.

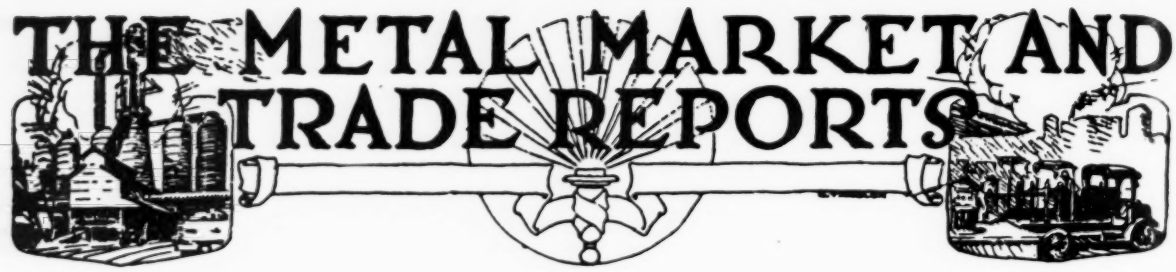
John Duncan, who has been pesident of the Wheeling Steel & Iron Co., of Wheeling, W. Va., a subsidiary of the Wheeling Steel Corporation, for about a year, resigned recently to enter into the coal and railroad business with a brother in St. Louis, Mo. Mr. Duncan has more than thirty years of experience in the steel business, and has been identified with the Wheeling Steel & Iron Co. since 1909, and from 1914 until 1920 was vice-president as well as general manager of sales of that company. In 1889, he started with the National Tube Co., in St. Louis, later he was with the Western Tube Co., Kewanee, Ill., and again with the National Tube Co., as assistant general manager of sales in Pittsburgh.

L. B. Scott, formerly with the Wolff Manufacturing Company, has joined the sales force of the American Tool & Machine Company, of Baltimore, Md. He will have charge of the Minneapolis office, from where he will cover Minnesota, Michigan and Wisconsin. The American Tool & Machine Co. has just opened several new offices, including one in Chicago at 504 C. & N. W. Bldg., with A. A. Tcheile in charge, and another at 621 Finance Bldg., Kansas City, Mo., from where C. B. Fuller will cover Missouri, Nebraska, and Kansas. E. F. Hicks will have charge of western Pennsylvania and West Virginia, for the same Company.

TRADE LITERATURE

New Catalog of J. L. Mott Iron Works.

Catalog No. 10, describing and illustrating plumbing fixtures and bathrooms for residences and apartments, has just been issued by the J. L. Mott Iron Works, Trenton, N. J. The catalog contains 124 pages of heavy glazed stock, which reproduces the illustrations in splendid fashion, and is bound in a heavy paper cover printed in four colors. It is prefaced with a few words on the importance of the bathroom, and with short stories on the process of manufacturing all-clay body and cast iron, porcelain enameled fixtures. There are fourteen four-color reproductions in the front of the catalog, eleven of which are of complete bathrooms. These give good ideas of colored tile bathrooms, which are fast becoming popular in the East. Each fixture illustrated in the catalog is completely described.



Steel and Iron.

Billets and sheet bars as low as $30, Pittsburgh, were features of the tenders last week in the effort of independent interests to get action into the lethargic market for iron and steel. This does not represent the general action, but sufficient of the producers of raw steel have formally notified customers of their price to give sheet bars a range of from $30 to $35 and small billets on the same level. Very few producers have refused to meet competition in the matter and some are quoting $32 for sheet bars and billets and $3 for slabs. The new low price has been brought about in the main by the representation of independent sheet producers that until sheets could be further lowered demand would not revive and to lower further would necessitate a lower cost in sheet bars. Since the new low price on sheet bars has come out a good many independent sheet mills have tendered sheets as low as 3.24 cents and one is reported to have named 3 cents for black sheet base. Blue annealed is being quoted at from 2.35 cents to 2.50 cents and galvanized from 4 cents to 4.25 cents.

While the trade is fully cognizant of these reductions, it was only toward the end of the week that open discussion of these prices and recognition of them in the answering of inquiries became general. The downward sentiment in prices to boost business reached plates and shapes, these breaking to 1.75@1.85 cents in separate quotations. The same price is governing structural material.

But as a general proposition the week closed with a decidedly better tone to the steel market as the result of an increase in scattered buying in which the railroads and automobile industries figured more or less prominently. There appears to be a revival of confidence from which much is expected and, while the movement may be slow during the remaining summer months, there are grounds for belief that by the opening of the fall season business will be on a much surer basis. With the period of depression has come a period of readjustment, not only of price but of policy. The latter is likely to embrace many economies, one of which may be a shifting of the burden of stocks so far as possible from the consumer to the producer. The latter in this event will be left to regulate his output to meet the current demands. In other words, it is believed that the general policy will tend to avoid overproduction or overstocking against future requirements which may be facilitated by prompt and adequate transportation. Much will depend upon the ability of the roads to meet the situation and the steel industry also looks to them as the source of a very considerable market. That things are taking a turn for the better is evidenced by a recent increase in demand for car repair and track materials. Inquiries are in the market from the New York Central and bids will be opened August 1 for 7,500 to 9,000 kegs of track bolts, 15,200 to 22,000 kegs of track spikes, 5,000 to 12,000 angle bars for the 80-pound rails and 40,000 to 80,000 tie plates for 100-pound rails. Further inquiries are expected from the same road for bars, sheets, shapes and plates. Other railroad activity is reflected in orders received from car building companies.

The week's result of pig iron trading were to soften the basic market with steel company blast furnace naming as low as $18.50 valley for spot tonnage. Bessemer has been so negligible in trading that its price is a matter of uncertainty. In carload lots the best price reported is $21 valley, and some moderate tonnages have been booked at $20.50, but the aggregate is too small to make this price a safe market criterion.

In the New York market pig iron is moving slowly as to gross volume, but there has been at least a fair demand for small scattered lots. Competition has not been lessened by the lighter demand and prices still show a tendency to decline.

At Birmingham the disposition of the pig iron market is to harden around the $20 base, although this price is undoubtedly shaded at times, but as melters find it more and more difficult to obtain the grades desired on account of furnace idleness and ill-assorted stocks, the price will tend to harden.

The fact that contract coke in the Connellsville region has been offered at $3, and a contract covering a period of 90 days at below $2.75, indicates that the coke industry is trying to find the bottom of the market and is sounding out the prospective trade carefully. Prices for pig iron are quoted as follows:

No. 2 Pittsburgh	$21.46@21.96
No. 2X Philadelphia	21.85@22.30
No. 2 Southern Birmingham	20.00@20.50
No. 2 Chicago	18.50@19.00
Basic Valley, furnace	19.50@20.00
Bessemer, Pittsburgh	20.96@23.46
Bessemer, Valley	20.75
Basic, Pittsburgh	20.00

Copper.

There is nothing encouraging to report for the copper market at the moment. Demand has been and continues to be exceptionally light and the market has been steadily receding into dullness. Buying in a limited way, consumers are able to pick up small lots of more or less distress material which is being offered by dealers at ¼ cent below the producer's terms. The latter have followed the market down, but with indifferent success. It was possible to procure copper in a small way at 12⅛ cents and it was even reported that business had been done at 12 cents, but this may have reference to metal in warehouse, subject to delivery charges which would bring the price close to 12¼ cents. The producing interests, large and small alike, express a willingness to accept business at 12½ cents for July-August, but September is not quoted.

Lead.

The market for lead at the close of the week was quiet and somewhat easier in tone, though there has been no great pressure to sell and prices have held up to current levels for some time. The official price of the American Smelting and Refining Company is still 4.40 cents New York and East St. Louis, but the independents, while quoting the same price for New York are offering Western shipment on the basis of 4.20 cents to 4.25 cents East St. Louis.

Zinc.

There is little demand for zinc, and the market, while unchanged at the close of the week, was easy at quotation of 4.20 cents to 4.25 cents East St. Louis.

Tin.

Consuming demand for tin was almost negligible and speculative trading was no more than moderate all of last week. On Saturday there were sellers of Straights in all positions at 26¾ cents. Arrivals during July have been 1,225 tons at Atlantic and 20 tons at Pacific ports. Tin afloat is estimated at 2,690 tons, mostly from Straights.

Other Metals.

Quotations on other metals in New York are as follows:

Aluminum Powder ..... .61 cents per lb.
Aluminum (in 15-ton lots) 99% and purer..28.50 cents per lb.
Antimony (Chinese and Japanese)..... 4.75 cents per lb.

New York Old Metal Market.

The following prices are current for old metals:

	Buying	Selling
Copper, heavy	9 to 9¼ cents	10¼ cents
Copper, light	8 to 8¼ cents	9¼ cents
Brass, heavy	4½ to 4¾ cents	5¾ cents
Brass, light	4 to 4½ cents	5½ cents
Lead, heavy	3½ to 3¾ cents	4¾ cents
Tea lead	2¼ to 2½ cents	3½ cents
Crucible copper	10 to 10¼ cents	11¼ cents
Solder joints	5½ to 5¾ cents	6¾ cents

Chicago Old Metal Market.

Chicago wholesale dealers' prices are nominally as follows:

	Buying	Selling
Heavy yellow brass	5 to 5¼ cents	6¼ cents
Brass, light	4½ to 4½ cents	5½ cents
Red brass	7 to 7¼ cents	8¼ cents
Copper, heavy	8 to 8¼ cents	9¼ cents
Copper, light	7½ to 8 cents	9 cents
Lead, heavy	3 to 3¼ cents	4¼ cents
Zinc	2½ to 2¾ cents	3¾ cents

NEW CONSTRUCTION WORK.

The following are among the most important contracts recently awarded as reported by the "American Contractor":

$4,200,000 store, Newark, N. J.; L. Bammerger & Co.

$2,000,000 office, store and shop building, Chicago, Ill.; H. Emmerman.

$800,000 apartment building and garages, Milwaukee, Wis.; Harley Investment Company.

$700,000 theatre, Wichita, Kan.; Orpheum Building Co.

$600,000 hospital, Saginaw, Mich.; Saginaw General Hospital Association.

$500,000 sewer, Detroit, Mich.; Department of Public Work.

$300,000 school, Dundee, Ill.; Board of Education.

$250,000 school, Arkansas City, Kan.; Board of Education.

$225,000 school, DeKalb, Ill.; Board of Education.

$224,000 school, Columbus, Ohio; Board of Education.

$200,000 school, Vinton, Iowa; Board of Education.

$200,000 school, Chicago, Ill.; Board of Education.

$200,000 school, Chicago, Ill.; Board of Education.

$200,000 sanitary sewers and disposal plant, Wyomissing, Pa.; Wyomissing Valley Disposal Company.

$180,000 hospital administration building and connecting corridor; Elizabethtown, Pa.

$179,000 club house, Newark, N. J.; Newark Athletic Club.

$150,000 church, Oak Park, Ill.; The First Baptist Church of Oak Park.

$150,000 church, Streator, Ill.; Park Presbyterian Church.

$150,000 school, Clifton, N. J.; City of Clifton, N. J.

$110,000 school, Morris Plains, N. J.; Board of Education.

$100,000 sewer system, Cuyahoga Falls, Ohio; City of Cuyahoga Falls.

$100,000 bank, Kansas City, Mo.; Peoples Trust Company.

$100,000 Masonic Temple, West Hoboken, N. J.; Doric Lodge No. 87.

$100,000 church, school auditorium and rectory, Park Falls, Wis.; St. Anthony's Catholic Congregation.

$100,000 factory, Charlottesville, Va.; L. Robinson & Co.

$100,000 factory, Bradford, Pa.; Salamanaca Furniture Co.

$100,000 store and office building, Cleveland, Ohio; Jacob Babin.

$100,000 school, gas engine laboratory and plunge room, Detroit, Mich.; Board of Education.

$250,000 store building, Richmond, Va.; Thalhimer Bros.

$182,399 barge canal ternimal, Rochester, N. Y.; State of New York.

$135,100 court house, Osceola, Nebr.; Polk County, Nebr.

$120,000 school, Wichita, Kan.; Board of Education.

$825,000 school, St. Clair, Mich.; Board of Education.

$400,000 public market, Jamaica, L. I., N. Y.; owner's name withheld.

$300,000 school, Chicago, Ill.; Board of Education.

$270,000 school, Chicago, Ill.; Board of Education.

$200,000 warehouse, Newark, Ohio; The American Bottle Co.

$150,000. School, Redfield, Iowa. Consolidated School District.

$140,000. Auto Display & Garage, Cleveland, O. The Northampton Realty Co.

$125,860. School, Lakewood, O. Board of Education.

$125,000. Warehouse, Detroit, Mich. Harvey & Sons Co.

$125,000. Plant, Winnetka, Ill. City of Winnetka.

$125,000. Parochial School, South Orange, N. J. Our Lady of Sorrow Roman Catholic Church.

$125,000. School, Woodstock, Ill. Board of Education.

$125,000. Community Building, Yonkers, N. Y. Knights of Columbus.

$100,000. Factory, Columbia Heights, Minn. Northwestern Spring Mfg. Co.

$100,000. Church, Pontiac, Mich. First Presbyterian Church.

$100,000. School, Medford, Minn. Board of Education.

$450,000. School, Watertown, S. D. Board of Education.

$270,000. School, Grinnell, Iowa. Board of Education.

$235,000. Sewers, Akron, O. City of Akron.

$188,685. Hospital, San Antonio, Texas. Santa Rosa Hospital.

$150,000. Church, Wichita, Kans. United Congregation.

$300,000—Department Store, Brooklyn, N. Y. Oppenheim-Collins Co.

$250,000—Slaughter House, New York City. Figge & Hutwelker.

$200,000—Store and Club Building, Akron, O. High St. Hollings.

$172,000—School, Cynwood, Pa. Board of Education.

$125,000—Establishment, Richmond, Va. Old Dominion Beverage Corporation.

$125,000—Convent and Chapel, Ilchester, Md. All Saints Protestant Episcopal Convent.

$125,000—Club House, Bayside, L. I., N. Y. Oakland Golf Club.

$118,000—School, Kingwood, W. Va. Board of Education.

$110,000—Grade School, Oceanside, L. I., N. Y. Board of Education.

$100,000—School, Evansville, Wis. Board of Education.

$100,000—School, Richmond, Va. Broad St. Methodist Episcopal Church.

$100,000—School Larchmont, N. Y. Board of Education.

$100,000—School, Roselle, N. J. Borough of Roselle.

AMONG THE PLUMBING AND HEATING CONTRACTORS

Illinois

Chicago.

George A. Leebody, 1665 Waveland Avenue, and L. B. Piper & Co., 1258 Wrightwood Avenue, have the plumbing and heating contracts, respectively, on the one-story garage building being erected at 2524 Lawrence Avenue for H. W. Bowman.

M. J. Corboy, 178 West Randolph Street, has secured the contract to install plumbing in the eight-story catalogue publishing house to be erected on Harrison Street between Marshfield Avenue and Paulina Street for the Phillipsborn Outer Garment Co.

William Gawne, Jr., 5812 West Madison Street, has the plumbing installation contract on the one-story, $20,000 residence to be erected at 409 Williams Street, River Forest, Ill., for Charles G. Lamb.

Noble & Thumm, 2313 Lincoln Avenue, have been awarded the contract to install plumbing and heating systems in a residence to be erected on Maplewood Avenue near Devon Avenue.

M. J. Corboy, 178 West Randolph Street, has the plumbing contract, and the General Heating & Ventilating Co., Milwaukee, Wis., have the plumbing and heating contracts, respectively, on the $825,000 two-story high school building to be erected in St. Clair, Mich., for the Board of Education of that city.

David F. Walsh, 9016 Cottage Grove Avenue, has the contract to install plumbing in the $200,000 three-story Marsh Branch school to be erected on Calhoun Avenue and East 107th Street for the Board of Education of Chicago.

The A. C. Flynn Heating Co., 6402 South Ashland Avenue, has the heating contract on the $35,000 one-story school addition for the Sacred Heart Catholic congregation at 4602 South Honore Street.

N. B. Brown Co., 19 South La Salle Street, has the heating contract, and Noble & Thumm, 2313 Lincoln Avenue, the plumbing contract on the $40,000 two-story store, office, and flat building to be erected at Lawrence and Crawford Avenues for Nixon & Prasses. The building will be 75x100 ft., and contain seven stores and seven offices.

Ben Rigby, Inc., 545 West Lake Street, has the heating remodelling contract on the store and art building at 1054 Lawrence Avenue, which is being remodelled into a store and hotel building at a cost of $25,000.

Other Cities in the State.

The Biever-Farrell Co., Aurora, has the contract to install plumbing and heating systems in the $60,000 three-story factory building to be erected in that city for the Miller, Bryan & Pierce Co. of that city.

Fred Flader, 1914 Central Avenue, Evanston, is to install plumbing in the two-story $20,000 residence to be erected at 1002 Sheridan Road for R. V. Murison.

The A. M. Murray Co., Hoopeston, has the plumbing and heating contract on the $75,000 addition to the community high school building in Henning, Ill.

The Knauer Co., Mendota, has the contract to install plumbing and heating systems in the $80,000 building which is to be erected in that city for the Elks' Club.

Indiana

Indianapolis.

One of the most reliable barometers of business in any community is the new building work that is being done in that particular town or city, according to Joseph G. Hayes, of Hayes Bros., plumbing, heating and ventilating contractors at 336 West Vermont Street, Indianapolis. "Show me a town or city where new residences are being erected, new schools, churches or public buildings," said Mr. Hayes, "and I will show you a community that is prosperous—a community that is alive to its possibilities and whose citizens are progressive. On the other hand, if the city or town has no new buildings going up you will find a town where business is dead and where there is no public spirit. Wherever new work is being pushed, one generally can find a measure of prosperity, or at least of business activity. People do not build new homes, or increase their factory outputs, or build new schools and churches, unless they have explicit faith in their home town and money to support that faith."

Hayes Bros. have been busy all year with several large contracts negotiated earlier in the year. The new building situation as it applies to public buildings is rather quiet. Mr. Hayes says, although out in the state quite a number of school buildings, business houses, office structures and large residences are going up. The firm has two large contracts for installing heating and ventilating systems at Richmond, and also is installing a heating and plumbing system in the new Citizens Bank building at Terre Haute. In Indianapolis the firm has contracts for the installation of plumbing and heating systems in three school buildings. "I believe there will be a marked improvement in new building work in Indianapolis during the coming autumn and winter," said Mr. Hayes. "There is great need for new buildings. If we are to get down to a normal basis of doing business, more houses are necessary, for as long as there is a shortage of homes rents will remain high. I believe things will take a turn for the better soon."

More than ten miles of piping were used in the plumbing system of the million dollar Hotel Sonntag and Victory theater, a six-story brick structure erected at Sixth and Main Streets, Evansville, for the Consolidated Realty & Theaters Co. "The plumbing in the new Hotel Sonntag is of the very latest type and places the hotel in a class with the largest in America," said H. G. Newman, of the H. G. Newman Plumbing Co., of Evansville, which had the contract for the work. Every room is equipped with built-in porcelain tubs, with showers attached, solid china lavatories and flush valve closets. In the basement is a general toilet room for the hotel and on the second floor there is a ladies' toilet and rest room. Numerous drinking fountains are installed at various places throughout the building, all of the sanitary bubbling type. The plumbing in the theater was carried out to assure the patrons a maximum of comfort, drinking fountains being provided in the main entrance and

rest rooms on the mezzanine floor. Each dressing room is equipped with lavatories and showers, and under the stage are toilet rooms and showers for the musicians and stage help. A circulating system has been provided in connection with the hot water so that hot water can be drawn immediately at all faucets. A 3,000 gallon tank of water is carried on the roof to supply water in event of an interruption of the city's water service. More than 10 miles of various sizes of pipe were used in the hotel and the theater in the following number of fixtures: 83 bath tubs, 108 shower baths, 140 lavatories, 135 closets, 9 slop sinks and 5 drinking fountains. More than 75,000 cu. ft. of fresh air will be drawn into the new Victory theater and Hotel Sonntag every minute, cooled to an average temperature of 70 degrees all through the two buildings and then circulated in every nook and cranny. A large fan in the ceiling exhausts bad air at the rate of 55,000 cu. ft. a minute, thus insuring a continual circulation of pure fresh air. "The ventilating system both summer and winter is equal to that of the best playhouses in Chicago and New York," said Walter Gottman, of the firm of Gottman & Weber, who had personal supervision over the installation of the heating and ventilating systems. The air is cooled by water of 54 degrees, pumped up from wells 90 ft. below the ground level. It is washed and purified before being circulated in the building, and as soon as it is circulated it is drawn through the roof. The movement is continual." The working of the ventilating system was seen a few days ago when a cameraman made several flashlight photographs of the interior. The smoke from the powder disappeared almost instantaneously through the roof, although there apparently was no draft in the building. The power plant consists of three large boilers equaling 425 horse power, which enables the hotel and theater to heat auditorium and rooms thoroughly by vacuum steam heat.

The Sanitary Heating & Plumbing Co., of Muncie, was the successful bidder for the heating and ventilating contracts on the new consolidated high school building that is to be erected at Peru at a cost of $100,000.

Pennsylvania

Pittsburgh.

A permit has been granted by the city of Pittsburgh to the owners of the Empire Building allowing them to increase the height of that building to thirty stories. The permit for this addition was refused by the building department, in accordance with the ruling of the new planning and zoning commission, which restricts the height of office buildings in the city.

R. G. Maloney, P. R. Marshall, William Lodge, H. J. Harrison, H. W. Fisher and H. F. Enseln, at Pennsylvania Master Plumbers' Recent Convention in Allentown, Pa.—From "Domestic Engineering" Photo.

The following have recently been granted master plumbers' licenses in Pittsburgh: Emil G. Gall, Jos. L. Benson, William C. Duffy, Joseph W. Schneider, Fred J. Kunold, Thomas G. Lambert, Jr., Bernard L. Bonner, John J. Coates, Bartley A. Griffin, James A. McKissock, John A. Carver, J. O'Neill Carr, Joseph Dezort, Anthony J. Leffler, Harry M. Walker, Walter Reese Powers, Frank Vierling, John C. Godfrey, Jr., Harold E. Tolman, Andrew Newbrand, Joseph A. Mader and Henry E. L. Goetz.

Reading.

John D. Engle, 504 Court Street, has the plumbing contract on a comfort station to be erected in that city, and the plumbing and heating contracts on two residences, and the contract to remodel the plumbing and steam tables in the Crystal Lunch room.

Ralph R. Seidel, formerly located at 219 Franklin Avenue, is now occupying quarters at 113 South Third Street.

The Reading Heating & Ventilating Co., 35 North Ninth Street, is installing the heating system in the Albright College in Meyerstown, and in the temple building of the Knights of Malta.

Frank Miller, 324 North Ninth Street, is installing the sewer line in the north end of Reading, and is also installing plumbing and heating in seven apartment building being erected in that city.

Samuel E. Fritz, 401 Elm Street, is installing plumbing, and William H. Taylor, Allentown, the heating and ventilating systems, in the addition to the Davis, Pomeroy & Stewart building in Reading.

Howard J. Fritz, 707 Walnut Street, has the contract to install plumbing in the new building for the Reading Hardware Co. to be erected at Foot and Sixth Streets. William H. Taylor, Allentown, has the heating contract.

Corbit Bros., 518 Franklin Street, are installing plumbing in the Clyde Court Apartments at Penn Side, Pa.

Scranton.

H. N. Gardner & Sons, 920 Greenridge Street, were the successful bidder for the plumbing in the new Dime Bank building on Wyoming Avenue. The plumbing in the new State Theatre on Wyoming Avenue and the plumbing and heating in the new Greek schools at Elmhurst, Pa., also two heating jobs on Delaware Street, amounting to about fifty thousand dollars all told, were awarded this concern.

Charles E. Wenzel & Son, 242 Adams Avenue, have the plumbing contract for the Lackawanna County court house on the square, Scranton. E. A. Campagne & Co., 827 Lackawanna Avenue, will do the heating and ventilating in the same building.

Wardell & Barrett Co., 335 North Washington Avenue, are installing plumbing in the east end comfort station at Nay Aug Park.

James J. Dempsey, 803 Capouse Avenue, was awarded the contract for the plumbing in the comfort station in the west end of Nay Aug Park, the plumbing and heating in the comfort station at Providence Square, and the remodelling of the plumbing in No. 27 Scranton public school.

Hagerty Bros., 238 Penn Avenue, will install the plumbing and heating in the Abhert Apartments on Calfex Avenue.

Joseph F. O'Hara, 1400 North Washington Avenue, has been awarded the contract for the heating and ventilating in the Dime Bank building, the plumbing in the new Text Book building on Ash Street, the plumbing in the 109th Regiment Pennsylvania National Guard Armory on Adams Avenue.

Clark & Lynot, Rookery Building, are installing the plumbing in the Edward A. Bosak residence on Sunset Avenue.

H. A. Riefenburg & Co., 621 Linden Street, are installing plumbing in the Gains Apartments on Monroe Avenue, Dunmore, Pa.

P. E. and M. T. Howley, 233 Wyoming Avenue, will install the plumbing in the Warren residence on Quincy Avenue, and plumbing and heating in the new Lycme Theatre on Wyoming Avenue.

Stanley Florey, 718 North Main Street, has secured the contracts for the plumbing and heating to be installed in the Italian Mission Schools on North Main Avenue.

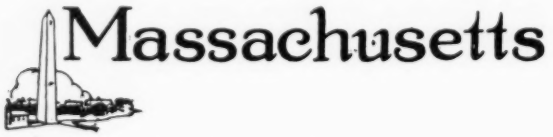
Other Cities in the State.

Von Beck Bros., Carbondale, were awarded the contracts to install the plumbing and heating in the Elk View Golf Club house at Crystal Lake, Pa.

Ray H. Johnson, 105 North Blakley Street, Dunmore, has the contract for the plumbing and heating in the new residence of M. T. Tuttle on Fifth Street, Dunmore, Pa.

Leonard Forselius & Co. recently have opened a plumbing establishment at 713 State Street, New Haven. The equipment includes an attractive showroom. Mr. Forselius is an experienced plumber and has had charge of a number of large contracts in various sections of the state in the past.

Burack & Greenhouse, of New Haven have a number of good contracts in hand including plumbing and heating in buildings at 123, 125, 127 and 129 Court Street and 587 State Street for Max Cosoff; and similar work in a garage at 67 Park Street.



The Hobart & Farrell Co., of Brockton, has been awarded a contract for a new steam heating plant for the Sprague school building on a bid of $26,989. Other contracts recently awarded by the Brockton public property committee include plumbing in the Winthrop school which went to C. F. Dohlborg & Sons and changes in the heating plant at the Perkins school to Charles B. Howard.

In preparation for the annual event at the grounds of the Eastern States Exposition in Springfield the middle of September, plans are being made for extensive improvements. These will include a new ventilating system in several of the buildings, the construction of a permanent Red Cross Hospital, the erection of a women's sanitary at the western end of the grounds and the installation of a number of additional drinking fountains at various points.

A contract for plumbing and ventilating systems in the Cogswell schoolhouse at Haverhill has been awarded to O. F. Bennett of that city who was the lowest of several bidders.

Contracts have been let for a junior high school building at Longmeadow which will cost in the vicinity of $125,000. The heating and ventilating went to George R. Esterbrook for $7,180 and the plumbing to the Armeson Plumbing and Heating Company for $7,300.

The Martin W. Dugan Co., of Newburyport, has been awarded a contract to install a central heating plant for the W. D. Hannah Company of that city. The plant will heat practically an entire block and calls for an expenditure of several thousand dollars. The Dugan Company is now engaged on a big plumbing and hot water contract for the Hannah Company.

The general contract has been let for a new public comfort station to be erected in Buttonwood Park at New Bedford.

Plans for a building at Crystal Park, Worcester, which would include sanitary conveniences, shower baths and disrobing rooms have been placed in the hands of contractors for bids. The building is estimated to cost $6,000.

School contracts recently awarded in Lynn include: heating and ventilating system in the Cook Street school, C. S. Cunningham, $8,785; new drum in steam heater at Breed school, H. W. Heath; drain at Classical high school, John W. Sheehan. In each case the contract was given to the lowest bidder.

J. J. Cotter, of Springfield, was the lowest of ten bidders for installing plumbing in the so-called Old Hooker school building which is to be remodelled and made into a public comfort station and was given the contract. Cotter's bid was $4,165.

Providence.

H. W. Seaborne, Hoppin Homestead Building, is installing plumbing in the summer home of F. E. Talbot at Little Compton, R. I.

William M. Keller, 391 Elmwood Avenue, is installing plumbing in the residence of C. Howard in Edgewood.

Tierney & Colgan have the contract to remodel the plumbing in a residence at 205 Pine Street.

P. and J. Tierney have the contract to remodel the plumbing in property on Grove Street.

Los Angeles.

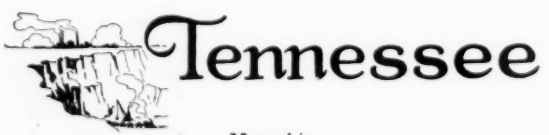
The Walnut Park section of Los Angeles is to have a modern office and theater building of two stories, with a frontage of 122 ft. on Long Beach Boulevard, and 160 ft. on Florence Avenue. The cost of the structure is estimated at $175,000. A. H. McColloh prepared the plans.

A new two-story brick structure, known as the Robinson Building, is to be erected on the east side of Western Avenue, near Santa Monica Boulevard. It will contain two stores on the first floor with apartments and offices above.

Architect Robert H. Orr has prepared plans for a dormitory building to be erected for the College of Christianity on North Vermont Avenue at a cost of $60,000.

Other Cities in the State.

The contract for a new theater to be erected on the north side of Main Street between Third and Fourth Streets, Alhambra, has been awarded to the Darrell-Condley Co. of Los Angeles. The general contract with equipment represents a total investment of about $60,000.



Memphis.

Announcement is made that the firm of Simpson & Tucker, plumbing and heating contractors at 2096 Madison Avenue, on July 1, 1921, dissolved partnership by mutual consent. D. L. Simpson will continue business as the Simpson Plumbing & Heating Co. at 206 Madison Avenue and G. R. Tucker has moved to his new building at 2080 Madison Avenue under the name of G. R. Tucker & Co.

The Jackson-Lyle Plumbing & Heating Co. is the name of a new firm recently opened in Memphis by J. T. Jackson and Jos. H. Lyle.

W. L. Eichberg, 189 Jefferson Avenue, is installing heating in a number of residences being erected in Memphis.

Joseph Anthoine has opened a new plumbing establishment at 4 Warren Avenue, Lewiston. Mr. Anthoine has been employed for several years by local master plumbrs and has had experience both in plumbing and heating lines.

Stanley H. Jewett, of Dover, is making preparations to remove his plumbing business from the Eldridge building on Main Street to a new building being constructed on North Street for Edward H. Chase. Mr. Jewett will occupy the street floor and basement affording him much better facilities for caring for his increasing business.

The new branch establishment which the C. H. Babb Company, of Bangor, Me., is to open at Lincoln is nearly ready. The business for the present will be located in a building on Mechanic Street. The concern already has a large number of plumbing and heating contracts in Lincoln on its books and has been trying for some time to find a suitable location for a branch shop.

PROVINCE OF QUEBEC.

Montreal.

Several plumbing contracts of considerable importance have been let in Montreal during the past week ranging from a $10,000 alteration job to a two million dollar office building. George A. Fuller & Co. are in charge of the construction of the last mentioned structure being erected by the Canada Cement Co. on the south side of Phillips Place. The building is to be ten stories in height, measuring 164x121 ft. W. G. Edge, Ltd., 116 Craig Street West, have the plumbing and heating contract on this structure and the plumbing on the new pathological building being constructed for the medical department of McGill University. This is to be a five-story building, costing $460,000.

Plumbing and heating in the new factory of the Parisienne Shoe Co. is to be installed by J. E. Blanchard & Fils, 2133 St. Lawrence Boulevard.

The Royal Bank of Canada is having buildings at Mount Royal Avenue and St. Lawrence Boulevard and at Mount Royal Avenue and Papineau Avenue remodeled into a bank building. In the first mentioned, L. E. Moulton & Co., Ltd., 142 Inspector Street, are installing a complete sprinkler system, a heating system, and remodeling the plumbing, while in the second case, Conroy Bros., 291 Centre Street, are doing the plumbing and heating work.

The plumbing and heating systems in the $35,000 apartment house on De l'Epee Avenue, Outremont, is being installed by Nap. Turcot, 1381 Clarke Street. Other plumbing and heating contracts recently awarded include a six-flat residential building, $18,000, on Champagneur Avenue, plumbing to J. E. Blanchard & Fils; an $8,000 residence to Beaudet & Cote; an $8,000 residence to J. Perreault; a $5,000 alteration job, plumbing and heating to John Gordon; a $3,000 job, altering residence into apartments, Paquette & Fortin; and a $6,000 alteration job to W. G. Bailey.

Z. Cusson, 1256 St. Lawrence Boulevard, is installing the plumbing in the $20,000 residence of L. Wisintainer on Gouin Boulevard.

BUILDING INDUSTRY REPORT.

By the Committee on Elimination of Waste in Industry of the American Engineering Council.

Half a million dollars a year in wages is being lost in the building industry through unemployment, it is asserted in a report made public by the Committee on Elimination of Waste in Industry of the American Engineering Council, appointed by Herbert Hoover. Lack of work is declared to be the outstanding fact in this industry, whose critical condition following the war is attributed primarily to high costs of construction.

Waste, it is said, is causing huge losses in building which, including all trades and common labor incidental to it, ranks second among the industries and contributes to the wealth of the nation more than $3,000,000,000 yearly. Yearly averages for the past six years show that 32 per cent of the activities of the industry, which employ some 3,000,000 mechanics and laborers in a single year, are devoted to residential buildings and 18 per cent to industrial buildings, "Miscellaneous" covering the rest.

The chief sources of waste in the building industry are, according to the report, irregular employment, inefficient management, and wasteful labor regulations. Customs or conditions prevailing throughout the industry, and poorly designed equipment are given as secondary causes.

The annual economic loss due to accidents is estimated as high as $120,000,000 Application of safety methods, it is stated, would save to the industry 12,000,000 days a year.

Loss through duplication of estimates and designs, and duplication in bidding, is said to run into the millions. An acute national shortage of housing exists, the committee says, with costs prohibitive to householder and banker. Improvement in production is noted as a result in part, of weeding out "war's misfits." Many union rules are condemned as "absolutely wrong." Both employers and employes are blamed for restriction of output.

The committee's investigation covered the entire country, special attention, the report says, being paid to representative cities such as New York, Boston, Philadelphia, Baltimore, Chicago, Cleveland, Atlanta and San Francisco.

The inquiry into the building industry was made as a part of a national assay of waste conducted by the committee, of which J. Parke Channing of New York is chairman and L. W. Wallace of Washington vice-chairman. This assay originated with Herbert Hoover, who recently retired from the presidency of the American Engineering Council, and embraced six leading industries. The building investigation was in charge of Sanford E. Thompson of Boston who directed a large force of field workers.

"The building trade workman," asserts the report, "is busy on the average about 190 days in the year, or two-thirds of his time. A few contractors, individually or associated, are attacking this problem with effective results. The public also must be educated to the need of a sensible distribution through the year of its construction demands and requirements. Idleness, however, is not due entirely to seasonal demands; strikes and lockouts are appreciable causes.

"Haphazard management in planning and controlling work and lack of standards, which often double the labor cost, characterize most construction undertakings. Here, again, a few builders, recognizing the waste in money and man power, are adopting methods that approach modern factory management.

"Union regulations in the past have produced enormous losses through direct or indirect restriction of output. Workmen and contractors, however, are beginning to appreciate that reduced output reacts in tremendous fashion upon themselves.

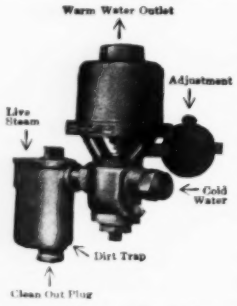
"In some construction trades accidents involve losses up to

The Plumber's Friend

You can make money with Powers Specialties—enough to pay all your overhead expenses.

Factories, Foundries, Mines, and Industrial Plants of all kinds need hot water at infrequent intervals.

The Powers Thermostatic Steam and Water Mixer



This is an instantaneous water heater, and meets this need effectually, affording a simple way of supplying water at just the right temperature, instantly. It's a money-maker for you, and a money-saver for your customer.

See that **Powers** equipment is used whenever you are consulted. One installation will bring orders for others and there's a big profit in each one for you.

Why not send in your name and let us mail you Bulletin 137 covering this particular specialty? You'll soon discover how you can pick up some extra profits.

The Powers Regulator Company
Specialists in Automatic Heat Control
952 Architects Bldg., New York.
2716 Greenview Ave., Chicago.
363 The Federal St., Boston.

The Canadian Powers Regulator Co., Ltd., Toronto, Ont.
(1474)

Something New—
The Dixie Gas Heater

It is the most economical water heater on the market, both to install and operate.

Note these features:

It burns less gas than any other tank heater.

Has a greater heating surface.

Heating surface is enclosed in asbestos and holds the heat.

No coils to lime or clog. Absolutely will not clog up.

Can be readily attached to the ordinary range boiler and requires no plumbing connections to boiler.

Requires less space than any other tank heater.

Does not leak or sweat.

If you want the new and replacement water heater business in your territory get more details and prices on the Dixie Gas Heater and get a demonstrator.

Write us for details

Southern Mfg. Co.
Birmingham -:- Alabama

ten per cent of the labor cost in addition to the human loss of lives and energy. The average loss, computed from insurance statistics, is about two and one-half per cent of labor cost. Here also certain contractors have found it possible to cut their accidents in half through special efforts.

"Greater co-operation between the workmen and the employers is an absolute essential. This co-operation must be attained before we can approach the elimination of labor difficulties. Such co-operation, however, is impossible without the removal of causes of friction and the working out of plans to this end.

"A striking fact about the building industry is that inasmuch as small buildings require so little capital or credit, and apparently so little technical ability, the field is full of small contractors, many of whom operate for a few years and then fail. In Cleveland, O., for example, out of 4,000 contractors perhaps not more than 400 are needed. From these small firms the range runs up to the highly capitalized company with yearly business in the millions, employing thousands of workers and having a trained technical organization."

The total shortage of housing in 1921, it is found, amounts to 53 per cent of the total square footage (called the real measure of value) constructed in 1915. "To this percentage must be added," the report continues, "if we consider the footage constructed in 1915 as equal to the requirements of that year, seven and one-half per cent which represents the increment required to cover the increase in population.

"The need for building is most evident. The costs are so high, however, that the householder cannot afford to buy, nor can the banker loan money because of the danger of loss through the inevitable fall in prices.

"The high cost of labor and materials in 1920 and 1921 prohibited bankers from loaning money on ordinary building and dwelling house construction. They reasoned, and correctly, that the price of materials and labor would drop so that buildings erected at a later date would cost less, thus causing a fall in the selling price. Added to this have been the income tax conditions, so that the funds which were at one time available for mortgages have been forced into tax-exempt securities. Notwithstanding, therefore, the shortage of housing and the need for new construction, the actual work going on has fallen to a remarkably small figure and this in turn has been reflected in unemployment. In certain cases advantage has been taken of the conditions.

"Much has been said in 1921 of the inefficiency of building labor during the last few years. However, except where effective management with well defined standards has been in operation, there have been similar complaints throughout the country. This inefficiency has been due to abnormal conditions.

"The war necessitated the calling into the ranks of unskilled workers and into the foreman class men unfitted by character or training for their jobs. The demand continued to exceed the supply, resulting in bidding for men and boosting of wages.

"Because of the unprecedented demand, organized labor forced concessions not only as regards increases in wages, which were usually justified by the increased cost of living, but also as regards working rules which led in many cases to curtailment of production. The speed needed on government work to win the war, with the lessened care for cost engendered by the cost-plus contract, resulted in less effective operation. The men naturally became accustomed to this inefficient method of working and it furnished in one sense a standard for future efforts.

"With the depression in business and the lessened demand for all kinds of labor, the average production in all industries is again approaching normal. Certain contractors are again basing estimates on the assumption that labor is normally efficient. The improvement is in part due to the weeding out of misfits in both labor and management."

Analyzing the causes of building waste, the report says irregular employment is due to seasonal fluctuations, bad weather, strikes and lockouts.

Inefficient management is blamed on failure to furnish continuity of employment; failure to plan work in sufficient detail; lack of proper schedules to allow proper co-ordination of scheduling, purchasing, delivery, with job requirements; lack of standards and adequate cost methods as a means of checking production; high labor turnover; failure to use proper amount or type of equipment; general failure to develop and use a greater amount of mechanical equipment; and waste of material through careless handling and improper plant operations.

Wasteful labor regulations, according to the report, consist of requiring skilled men to do work that could be performed by unskilled, restricting individual incentive through requiring uniform wages, limiting the number of apprentices, excessive reduction of working hours, restricting output by prohibiting the use of labor-saving devices, and jurisdictional regulations.

Additional sources of waste are failure of architects to furnish check plans and specifications, duplication of labor in estimating and often in design, and accidents which are particularly important in the building industry because of the extra-hazardous nature of the work.

Large fluctuations in the number of men employed by representative contractors, indicating also the great fluctuation in the volume of business carried on, are reported. Assuming that the figures for unemployment due to all causes in the building trades in Massachusetts are representative of the entire country, and if one-half of this unemployment could have been eliminated, the value to the building industry or its wealth to the country would have been increased as follows: 1915, $106,000,000; 1916, $91,000,000; 1917, $113,000,000; 1918, $85,000,000; 1919, $141,000,000; 1920, $192,000,000.

Representative average conditions in the building trades of Philadelphia and vicinity reveal lost or wasted time as high as 44 per cent among iron workers, 37 per cent among cement finishers, 36 per cent among steam fitters, plasterers helpers and stone cutters, 40 per cent among roofers and 29 per cent among painters and paper hangers. This percentage is based on the relation of the average days worked per year to the number of effective days possible.

The days at work average 189 per year for the various trades in Philadelphia. The average of estimates reported by contractors is 210 working days a year. Over half of the lost time, it is estimated, is due to bad weather and the balance chiefly in waiting for or looking for work.

An extreme example of labor turnover in Philadelphia is the case of a man who in the course of five and one-half years worked for 76 different contractors and was hired 108 times. The report says the enormous turnover causes losses to both employers and men, adding:

"Contractors have given the effect of labor turnover little consideration. In construction work this is particularly hard to determine, especially as the actual percentage of turnover constantly varies as the building progresses and the number of men is increased and then diminished. Men quit because of the type of work they are to perform, risk involved, unfair treatment by foremen, and so on. They are discharged because of lack of work, incompetence, laziness, causing trouble, or because better men are available.

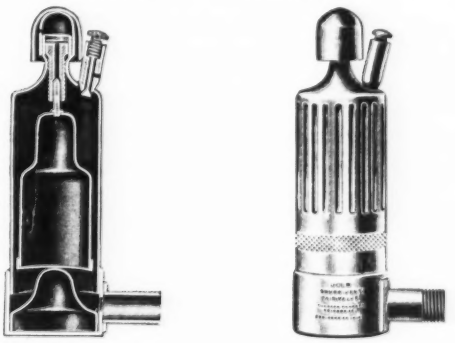
"Although efforts toward reducing seasonal unemployment have been local and often spasmodical, recent developments and conferences have shown the possibilities of vast improvement. The means of bringing about a reduction of seasonal unemployment may be outlined as follows:

"Allowance of a small margin of profit for both labor and capital during winter months, development of methods of conducting the work in cold weather, arrangement of work to

DOLE

Shure-Vent Air Valve

Backed by a REAL guarantee, covering life of heating plant



Order the DOLE—it works. Write for details

THE DOLE VALVE COMPANY

Makers of Dole Packless Radiator Valves

1925 Carroll Ave. CHICAGO

B & C

Floor and Ceiling Plates

No. 9
Carries the Best Discount

No. 10
Unsurpassed in Appearance

are backed by manufacturing experience and reputation of long standing.

The two plates shown here are made of best quality COLD ROLLED STEEL. The lighter shipping weight and larger discount allowed give you a lower cost than on cast iron plates, without any loss in appearance or durability.

Both are simply constructed and practical for all purposes. Make a neat, satisfactory job.

Write for catalog showing complete line

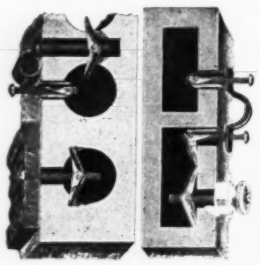
SEE OUR CATALOGUE IN SWEET'S

THE BEATON & CORBIN MFG. CO.

The Old Original Company

SOUTHINGTON, CONN.

PAINE TOGGLE BOLTS
"The Practical Toggle"



Save their cost in time and patience

THE PAINE CO.
1742 Van Buren St.
CHICAGO

Work instantly in any position in any hollow material.

BARRETT SEWER AND TIDE TRAP

Guaranteed to Live up to Every Claim made for it

The Barrett Trap is so designed and constructed that it cannot fail to operate properly. Opens easily for outward discharge and closes positively against metal seat. Inlet is much higher than outlet, making a positive flush.

A satisfactory trap in every respect.

Ask for descriptive matter

James Barrett Mfg. Co. 115-121 Pearl Street Boston Mass.

RADIATION CALCULATOR

A Scale for Calculating the Amount of Radiation Necessary for Steam Heating

T. J. MOONEY

HOW DO YOU FIGURE RADIATION?

With a MOONEY RADIATION CALCULATOR, you can figure the exact amount of radiation necessary for any size room or building, whether steam, hot water, or vapor heat is being used, and do it quicker than by any thumb rule. All on one chart—easily understood. Gives exact amount required. Has been in use for ten years and not one job figured by it has had to be changed.

Send us your name and address, and we will mail you one. Try it, then if you want to keep it, send us $1.25 after five days. We know you will want to keep it.

T. J. MOONEY
NASHVILLE, TENN.

Insurance
Against Flooded Basements

Where the Signet Drain is installed there can be no back water.
A perfectly reliable trap that automatically keeps out sewerage, gas and germs.

TRADE MARK SIGNET REG. U.S. PAT. OFF.

Always works. Nothing to get out of order. Brass working parts submerged.

The Signet is clean, sanitary, simple, durable and efficient.

Pat. Dec. 8, 1914

Write for details

CRAMPTON-FARLEY BRASS CO.
KANSAS CITY, MO.

provide indoor operations in cold and stormy weather, organization of a clearing house for co-ordination of activities, increasing the usefulness of employment bureaus, and educating the public.

"Contractors must prove to the public that they can carry on operations during the winter period as economically and substantially as during other periods of the year. To do this, contractors, labor, transportation, and material men in a locality must all get together and, after joint study of the situation, agree to reduce profits and wages an amount that will offset the increased cost of carrying on work in winter months.

"The education of the public is vital to a sensible distribution of work throughout the year. This applies equally to industrial, public, and residential construction and to household repairs and maintenance. Instead of crowding our main construction work into seven or eight months, all that can be deferred from the busy to the more idle season should be so scheduled. Owners making interior repairs or slight additions should be encouraged to have this work done in the offpeak season. Old buildings to be demolished to make room for new ones, should be torn down in cold weather in advance of the new construction instead of waiting, as is often done, until the new building ought to be under way.

"Real estate dealers lease apartments usually in October and do all redecorating work and repairing at this time. An architect in New York City has stated that some 25,000 painters and paperhangers are needed during this brief period, while normally only 5,000 men are required.

"With a central bureau, under the auspices of the employers, the workmen, and the public, these and many other things would be studied with effective results."

The strike is one of the great economic wastes to be found in the building industry, the report declares. "The waste to the men engaged, the contractor, and the public is hard to estimate. The major causes of strikes are occasioned by demands for increase in wages, recognition of the union, decrease in working hours, and by jurisdictional disputes.

"Incidental to these causes and often aggravating them are the working conditions, while in almost every case the prime factor is the lack of understanding and failure of the employers and the workers to get together.

"The number of strikes and lockouts occurring in the building trades increased from 302 in 1914 to 452 in 1919, an increase of 50 per cent. This increase is accounted for in part by the greater demand for labor in 1919, which inevitably makes the requirements of workmen more exacting and arbitrary. Of the 1919 figure, 452, only 18 or four per cent are listed as lockouts, so that the waste due to lockouts is relatively small."

If the Massachusetts rate of 138,519 working days lost in 1920 is applied to the entire industry a waste of some 3,000,000 days per year is found. The report continues:

"If the greatest cause, the demand for an increase in wages, could be eliminated, strikes as a factor of waste would shrink into insignificance. The remedy that suggests itself is co-operation. Management and labor must forget the sore spots of past conflicts and through whole-hearted co-operation fix by proper studies a minimum wage to correspond with a standard amount of production, with additional compensation for additional output. This would furnish an incentive to the men and would give recognition to deserving mechanics.

"Unions must co-operate to the extent of eliminating the flat rate for all mechanics of a trade, and to the extent of modifying the restriction that forbids mechanics to accept piece work. With definite standards fixed and with the co-operation of both parties fair incentives can be introduced.

"The most encouraging sign in the elimination of the above causes is found in what is known as the 'Philadelphia Plan' put forth by the labor element of that city."

This plan contemplates the organization into a single body

through associations, groups or committees, of each employing branch of the building industry in number at least equal to the nineteen represented in the Council of the Associated Building Trades. A heading up committee, composed of an equal number of representatives from the groups of employer and employed would constitute the tribunal or council of the building industry in Philadelphia. The plan purposes the establishment of a central bureau through which voluntarily all construction programs in the territory should be cleared, including national, state, municipal, and private work.

The old methods still exist in many quarters but are passing, the report says, adding:

"They must not be replaced by a 'go-easy' policy which takes all the stamina and character and individuality out of a man, but by well defined methods, such as definite records of accomplishment, scales of wages based upon quality and quantity of work done, or bonuses for coming within the required standards of quality and production. All of these devices, however, are worthless without determination of standards, knowledge of a proper day's work and control of the work and materials as above described."

General failure of the building industry as a whole to develop and use a greater amount of mechanical equipment is an established fact, the report says. Greater strides have been made in almost every other industry in the application of mechanical means, it is said. Union objections to labor-saving devices is wrong in principle, it is declared, and will be relegated to the past like the restriction of output.

"With thorough co-operation of unions with employers and the development of the old guild spirit, which tends to give a man pride in the quantity and quality of his work, there is the possibility of increasing production and, by these means, of maintaining high wages yet with a resultant lowering of costs," says the report. "Lower labor costs mean more building and more continuous employment for the worker.

"Many union rules are absolutely wrong and uneconomical. Many unions have exceeded the limits of fairness, and partly because of the leaders' lack of appreciation of the fundamental need for high production, have formulated by-laws, and, in individual cases, have formulated demands that have been a tremendous factor, directly or indirectly, in the restriction of output. This has resulted in increase in cost and reduction in the demand for building. It represents, in fact, one of the great sources of waste in the building industry. This policy has reacted, resulting in widespread opposition to unions. In fact, some of the most successful building contractors employ non-union labor because of their opposition to unjust union rules and requirements.

"It must be recognized that the unions are by no means alone in their restriction of output. The contractors and builders and supply dealers affect the situation to as great a degree indirectly by maintenance of high prices, collusion in bidding, and unfair practices. Collusion between unions and employers also has sometimes raised prices unduly.

"One of the greatest fundamental causes for low output is the fact that all members of unions in the same trade are paid the same wage. There is no incentive. As a result of records made by the authors on actual construction work, it was found that in the building trades on every job there are usually a few men who do one-third more work than the average man on this same job. These men also do better work. Is it fair to these good men for them to receive the same wage as the others?

"Restriction of apprentices in many cases is extreme and unfair. Overtime and travel rules, also, tend to increase building costs unduly.

"Many unions at the present time have in their by-laws no requirements for restricting output, contrary to good principles.

NORJO
Adjustable Concrete Insert
Instant Vertical Adjustment

DESIGNED especially for pipe work. Saves time and makes the best installation. Shipped complete. No extra dies, bolts or nuts required.

See your jobber

NORJO MFG. CO.
ST. LOUIS :: MISSOURI

Price Service Quality

TRAGESER PRODUCTS

Recognized by Master Plumbers as leaders in their particular field.

Our Line Includes:

Pantry Sinks, Copper and German Silver.
Drainboards, German Silver and White Metal.
Range Boilers, Copper and Galvanized.
Storage Tanks for Gasoline.
Expansion Tanks.
Pneumatic Water Supply Tanks.
Steam Thawing Machines.
Storage Tanks for Hot Water, Black, Galvanized and Copper.

Write for Catalog.

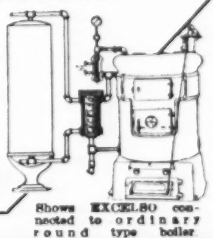
John Trageser Steam Copper Works
447-457 W. 26th St., New York City

EXCELSO
Meets New Requirements

It means no coils in the fire-box to deaden the fire. It assures an even tank temperature whether the fire burns wild or low.

The copper coils easily removable from the Excelso. Can be connected to steam, vapor or hot water boilers; also used for heating with live steam.
Made in five sizes. When used below the water line of steam or vapor boilers, it will heat tanks of from 30 to 120 gal. capacity.
No fitter should overlook this winning proposition. May we send particulars?

EXCELSO SPECIALTY WORKS
115 CLINTON STREET BUFFALO, N. Y.



Shows EXCELSO connected to ordinary round type boiler

KEWANEE

Tabasco Water Heaters are built of steel. You can't make any money repairing them, because they never get out of order. But every one you sell means a satisfied customer.

KEWANEE BOILER COMPANY
Kewanee Ill.

STERLING

STERLING SYSTEMS

Vacuum and Vapor Heating Specialties

Thermostatic Traps—Air Line Valves—Graduated Supply Valves—Air Eliminators—Damper Regulators—Return Traps

STERLING ENGINEERING COMPANY

Milwaukee Wisconsin

Economy Scale Remover Co., Inc.

CHICAGO HEIGHTS, ILLINOIS

Manufacturers of

Economy Boiler Seal
For making permanent repairs on cracked, leaky boilers. Saves buying new sections.

Economy Radiator Compound

Economy Scale Solvent
For automobile radiators and water jackets.

Economy Scale Remover
For removing scale from boilers.

Economy Soot Destroyer

WRITE FOR FOLDERS

MYERS

Myers Oil Force Pump

Why install costly tanks and expensive cabinets to store and handle lubricating and other oils when a MYERS OIL FORCE PUMP in many cases will answer just as satisfactorily.

Designed for use with the ordinary barrel or steel drum, it does away with the necessity of transferring liquids from the original containers. Knock out the bung or unscrew plug and insert MYERS FORCE PUMP in opening. Screw in tapering connection and start pumping. Simple as can be, inexpensive and satisfactory. No drip, no waste—saves time and labor. Practical for service anywhere.

Circular and prices on request.

F. E. Myers & Bro.

Ashland, Ohio

PORCELA

The Bath Tub Cleaner

Contains no grit.
No acid.
Keeps fixtures like new.

Most contracting plumbers use Porcela and recommend it to their customers.

If you haven't Porcela in stock order from your jobber. Write us for free sample can and descriptive folders.

PORCELA-RADAX CO.

NEW BRIGHTON, PA.

A potent source of labor waste is the jurisdictional practice which distributes certain types of work to different trades, frequently without regard to expense."

Despite the restrictive action of many of the union regulations, says the report, there is growing evidence of willingness to co-operate Philadelphia and San Francisco are cited as cities in which co-operation is evidenced. In Cleveland co-operation in tile setting, it is said, was hindered by employers. Co-operation in the needle trade of Montreal is pointed to as an example for the building industry.

Enormous losses are suffered through accidents, the $30,000,000 paid yearly to insurance companies for compensation and liability insurance by no means representing the total lost, according to the report, which adds:

"In the opinion of one of the best authorities in the country the actual cost of insurance represents not more than 25 per cent of the total economic loss, which brings the total cost due to accidents in the vicinity of $120,000,000 per year, a staggering total."

Great savings are possible, says the report. "An official of a large insurance company believes that by proper safety measures the waste due to accidents can be reduced 75 per cent to 80 per cent in from two to five years of honest effort, and that construction labor cost can be cut 3 per cent by these measures. Another official estimates, from actual accomplishment in safety measures, that a total of more than 12,000,000 days a year could be saved the industry by the application of safety methods."

Architects, the report says, frequently cause expensive delays and occasionally complete shutdowns by failure to deliver detail plans at the proper time. The waste of time and energy and money through duplication of estimates and of designs, it is declared, runs into the millions every year.

"The most encouraging feature in the building industry today is the action of a few of the builders and a few groups of building trade workmen in making intensive studies of the causes and remedies for irregular employment and haphazard conditions of work. Along with this is the growing appreciation on the part of both labor and management that to build more buildings and maintain high wages it is necessary to attain greater and greater productive capacity per man.

"They see as proof of these facts that the 1921 depression was caused and extended by too high costs of all products, and that business, either in manufacturing or in building industries, is improving only as the costs of material and the cost of labor are reducing. All are recognizing, in fact, that no progress can be made without paying greater and greater attention to the elimination of waste.

"Never in the history of our country was it so important that certain fundamental principles of economics—principles which are not mere theories, but are based positively on facts—should be accepted and established as a working program. These principles will throw overboard the fallacy that restricting production can make work go further, and will supplant this with the knowledge to get one must give, that to receive the equivalent must be given in money or in time or in effort, and that increased returns can only be attained through increased production."

In addition to Mr. Channing and Mr. Wallace the Committee on Elimination of Waste in Industry is composed of L. P. Alford of New York; George D. Babcock, Peoria, Ill.; F. G. Coburn, Philadelphia; Morris L. Cooke, Philadelphia; Harington Emerson, New York; Ira N. Hollis, Worcester, Mass.; E. E. Hunt, New York; C. E. Knoeppel, New York; Robert Linton, Butte, Mont.; Fred J. Miller, New York; H. R. V. Scheel, Passaic, N. J.; J. H. Williams, New York; Robert B. Wolf, New York, and William R. Basset of New York.

CONSTRUCTIVE IDEAS IN JUNE PRIZE LETTERS.

(Continued from Page 200.)

tical association of specialists in sanitary lines, upon whose shoulders rest the burdens of health and comfort for the community in which we live? Does our own community know that, like the lawyer, the doctor, or the architect, we must prove to the state in which we live, and that by strict examination, that we are competent to install work, which will be, for years and years to come, a sanitary safeguard to the health of every home in our community? Do they know that we are not only competent to judge, but also are compelled to be competent to pass upon their problems of health and sanitation, or are they allowed to form their opinions of our skill and science from Joe Miller's "Joke Book," or some such authority?

Do we, as an organization, hold our local meetings in clean, well-lighted, organization rooms, in the best part of our local business district, with our organization signs painted upon the windows, or do we meet in some deserted loophole of a dingy office building without any method of attracting attention, thereby fostering suspicion in the minds of those who know we do meet, that there is something wrong, something not open and above board, something to conceal?

It is, indeed, high time that we give more attention to the enlightenment of the public, to impress upon them that we are business men, that our business is open, honorable and above board, and that upon us the health of the community is dependent.

Earle C. Sabin.

The Letter That Won Third Prize, $5.

Every plumber should be back of the "Bath a Day" movement, boosting it with all the pep-talk-determination in them.

You know there are a lot of people in your town with small means. How can you tackle them? You know you can't get the dollar where there isn't any dollar, even if you do convince them of the importance of the "Bath a Day" habit. What are you going to do about it? The only answer, after you have convinced them of the need of a bath a day, is to get them to put their money, no matter how little, together and equip a public bath house and service station, making the sacrifice of each smaller financially.

What is a home without a bathroom?

How long would the new born babe last under unsanitary conditions, without his daily bath and the proper care? As you know, he must be given every chance at the start. How well he is taken care of when small, determines how strong he will be when grown up.

The death rate for babies in homes without bathtubs in Pennsylvania, in 1915, was 164.8. Homes equipped with bathtubs showed the death for babies to be 72.6—less than half the other figure.

This outrageous record is ground enough for the "Bath a Day" movement.

There is no special time in which to pull for the "Bath a Day" movement, so boost it right along. If you don't know how to go at it, consult the National Trade Extension Bureau, which has already lent many helpful suggestions, and which will be glad to outline a course for you. Make your town 100 per cent for having a bathroom in every home, and the "Bath a Day" habit.

What words can express the satisfaction one feels in leading one's travel weary guests to a sanitary, up-to-date bathroom? One feels quite the opposite in having only a sink in the kitchen to offer guests and an outhouse on the rear premises.

RAYMOND LEAD WORKS
735 So. Washtenaw Ave.
CHICAGO
Manufacturers
PLUMBERS
LEAD
GOODS
PROMPT DELIVERIES
LOWEST PRICES

"Mon-Seal"
CHICAGO POTTERY CO.
Specializes
in the manufacture of
Closet Bowls and Tanks
of "Whitest Vitrified China"
1924-40 CLYBOURN AVENUE
CHICAGO

GAUGE GLASS
IMMEDIATE DELIVERY
STANDARD AND HIGH PRESSURE
Our High Pressure Glasses have fused ends and are annealed by special process. Try them for highest steam pressures.
We manufacture Automatic Air Valves and Hot Water Thermometers.
MAGEE STEAM SPECIALTY CORPORATION
136-138 Beekman St., NEW YORK CITY

Fig. 384.

An AMERICAN Trap
for Every Lavatory
AMERICAN Cast N. P. Traps are sturdily built of highest grade material, finished perfectly smooth inside and out. Have deep seal and full sized waterway.
A wide variety of designs to suit every need. Send for Catalog.
AMERICAN SANITARY MANUFACTURING CO.
Abingdon, Illinois
Manufacturers of Fine N. P. Brass Specialties

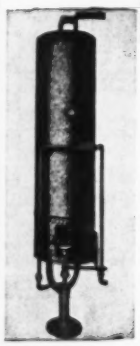
3-S

Best-By-Test

SHORTENED HORN
WATER CLOSET FLANGE

Write for Catalog and Prices

THE SANITARY SPECIALTY CO.
232 Mulberry Street, NEWARK, N. J.



ECONOMY AUTOMATIC
COMBINATION BOILERS
AND
GAS WATER HEATERS

ECONOMY GAS BOILERS
PEERLESS GAS BOILERS

Your Jobber Sells Them

ECONOMY HEATER COMPANY
108 SOUTH LA SALLE ST.
CHICAGO

No. 250

"BRE HYGIENIC" SPRING SEAT

Just the seat for that office building or factory job. It has an adjustable spring tension. A spring shock absorber that takes all jar and strain from the bowl. A stop that keeps the seat from striking fixtures in back and a "BRE HYGIENIC" seat.

Get our special prices for your show room or window display.

BRE MFG. CO.
Hyde Park Dist., Boston, Mass.

WHEN YOU MOVE
NOTIFY US

The post office is not required to forward second-class matter. To avoid missing an issue of DOMESTIC ENGINEERING when you change your address, fill out and mail this blank to us.

Name .....

Old Address .....

.....

New Address .....

.....

The "Bath a Day" habit will make a cranky person agreeable, a weary person rested, a dirty person clean, a sick person feel well, a discouraged person hopeful, a loafer thrifty, a dying person live, and it will make the old feel young.

Helen Howard.

Time Saving Method For Computing Interest.

In figuring interest accurately, it is necessary to consider 365 days a year, but the customary rule in banks is to consider a year 360 days, and a month thirty days. A note given at three months, however, is due upon the corresponding day of the third month, while a note given at ninety days is due ninety days after date. A note dated June 10th at three months is due September 10th, but if the note is given for ninety days it is due September 8th.

It would not be possible to give a method for computing interest that would be best in all cases, but for the business man the Banker's Method is the most satisfactory and will usually answer all his requirements and save him considerable time. This method is almost universally employed in business transactions. It is applicable to almost all interest transactions, and it is rapid and accurate. The rules governing this method are as follows:

Moving the decimal point two places to the left in any principal shows at once the interest on the principal sum:

For 120 days if the rate is 3 per cent.
For 90 days if the rate is 4 per cent.
For 72 days if the rate is 5 per cent.
For 60 days if the rate is 6 per cent.
For 45 days if the rate is 8 per cent.
For 40 days if the rate is 9 per cent.
For 36 days if the rate is 10 per cent.
For 30 days if the rate is 12 per cent.

For 7 per cent compute the result at 6 per cent and add 1/6 to the total.

For 11 per cent compute the result at 10 per cent and add 1/10 to the total.

Illustration.

Interest on $190 for 180 days at 3 per cent.
Pointing off $1.90 equals interest for 120 days.
.95 equals interest for 60 days.

$2.85 equals interest for 180 days.

Interest on $190 for 60 days at 9 per cent.
Pointing off $1.90 equals interest for 40 days.
.95 equals interest for 20 days.

$2.85 equals interest for 60 days.

Interest on $190 for 80 days at 5 per cent.
Pointing off $1.90 equals interest for 72 days.
.21 equals interest for 8 days.

$2.11 equals interest for 80 days.

Eight is 1/9 of 72. Dividing $1.90 by 9 equals $0.21.

CONVENTION DATES.

September 6, 7 and 8, 1921.—The annual meeting of the American Society of Sanitary Engineering, in Cincinnati, Ohio, with headquarters at Hotel Gibson.

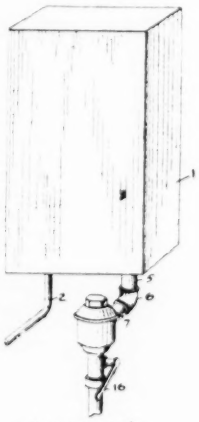
September 14 and 15 1921.—The autumn meeting of the National Association of Brass Manufacturers in Cleveland, Ohio.

Now is a good time to start pushing the "Bath a Day" campaign in your neighborhood.

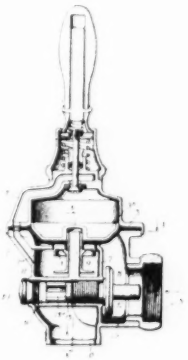
Patents

Plumbing Department.

1,383,273. Flushing Apparatus. Arthur H. Klahn, San Francisco, Calif. In a flushing apparatus, the combination of a closed tank, having an outlet larger than its inlet, both inlet and outlet located near the lower end of the tank, a valve casing on the tank outlet, the outlet of said valve casing smaller than its inlet, a float valve covering the outlet of said valve casing, and means to lift the float valve into the upper part of the valve casing to allow the water to be blown out of the tank.

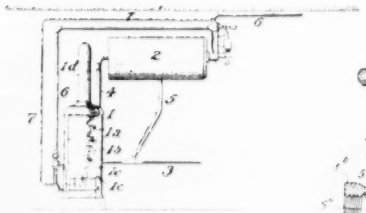


1,383,273.

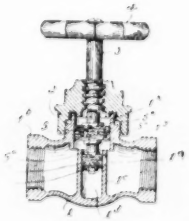


1,382,814.

1,382,814. Flushing Valve. Earl G. Watrous, Chicago, Ill. In a flushing valve, the combination of a casing having a laterally opening inlet, a downwardly opening outlet, and internal walls dividing the casing interior into inlet and outlet chambers communicating through a valved orifice, an axially movable valve for the inlet opening within the inlet chamber and having a stem extending through a wall of said inlet chamber and wholly within the confines of the casing, said casing having an opening for giving access to said stem, and a closure for said opening.



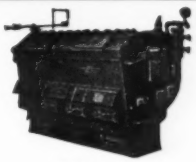
15,136



1,383,170.

15,136. Storage Water Heater. Edwin Ruud, Pittsburgh, Pa., assignor to Ruud Manufacturing Co., Camden, N. J., a corporation of New Jersey. In a storage water heater system, the combination of a water heater, a reservoir, connections between the same, a valve to control the supply of fuel to said heater, a thermostat in said reservoir, a lost-motion connection between said thermostat and valve and means to cause said valve to remain either entirely closed or completely open.

ECONOMY



EFFICIENCY

This is a
Pierce Down Draft, Magazine Feed, Smoke Consuming, Heating Boiler
Saves Fuel / Labor
Manufactured only by
PIERCE, BUTLER & PIERCE MANUFACTURING CORP.
Brooklyn, Boston, Worcester, Detroit, Syracuse, NEW YORK, Newark, Philadelphia, Baltimore, Washington

The
WILEY SAFETY VENT VAPOR REGULATOR

Provides the best
LIFE AND ACCIDENT INSURANCE for your vapor heating boiler
A peerless quality product manufactured and sold exclusively by
The Simplex Heating Specialty Co., Inc.
Lynchburg, Va.

"HAAS" Water Closets
are high grade, insuring maximum service and minimum expense.
PHILIP HAAS CO., DAYTON, OHIO

"Puritas" Closet Seat

Write for new booklet showing different styles of the "Puritas" Seat.
Standard Tank & Seat Co., Inc.
Camden, N. J.
Pure White and Guaranteed to Remain So!

When you order Bibbs, Cocks, Stops and Valves, be sure that you specify

"Haydenville Products"

Manufactured Only By

THE HAYDENVILLE COMPANY
HAYDENVILLE, MASS.
Since 1845

Cannot Overflow

No matter how badly the APEX Closet Bowl may be clogged, the non-overflow arrangement is certain of action.

Clean-out device located at head of trap where obstructions above sewer pipe can be easily removed without clean-out tools.

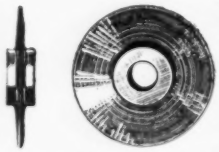
Get an APEX, try it out—you'll be more than pleased.

Write for details.

The Apex Supply Co., Inc., 203 E. State Street TRENTON, N. J.

FOR lasting quality and true capacity use *"KOVEN"* Pure Iron, Double Row Riveted, Galvanized Range Boilers, or *NACO* Galvanized Range Boilers made of open hearth steel. These boilers may be bought of jobbers everywhere.

L. O. KOVEN & BRO.
154 Ogden Ave., - - Jersey City, N. J.



Stands the Hard Knocks

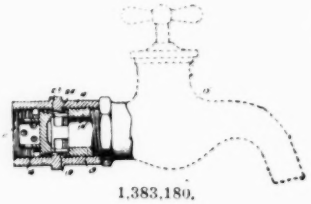
A cutter wheel that reduces the labor of pipe cutting to the minimum and will stand up, day in and day out, without breaking, is worth knowing about.

B&B THIN BLADE PIPE CUTTER WHEEL has proved superior in service to any other wheel made. Makes a clear, clean cut without burr. Does not spread metal apart. Made of highest class tool steel scientifically tempered. Every B & B Cutter Wheel is positively guaranteed. Get one from your jobber. Test it for yourself. You'll want more.

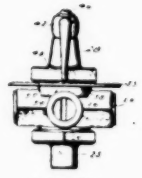
B & B TOOL & MACHINE WORKS
549 W. Washington Blvd. CHICAGO
Cutter Wheel Specialists

1,383,170. Valve. Ira E. Stump, Cleveland, Ohio. A combined service and drain valve, comprising a valve body provided with supply and service branches separated by a partition having a drain valve chamber intersected by drain ports communicating with the service branch and exterior of the valve body respectively, a main valve chamber arranged above said drain valve chamber and said partition, and a valve stem provided with main and drain valves operating in said main and drain valve chambers, respectively, said main valves being adapted to be seated on said partition and close communication between said supply and service branches, and said drain valve being arranged to open said drain ports to permit fluid to pass from said service branch to the exterior of the valve body when the main valve is fully closed, and to permit fluid to flow therethrough from both branch pipes when the main valve is between its fully closed and fully opened positions.

1,383,143



1,383,180.



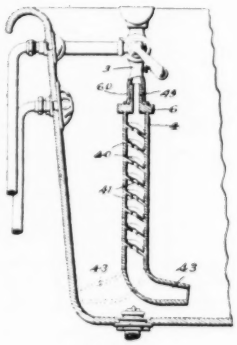
1,383,231.

1,383,143. Hydraulic Ram. James Oliver Kafader, Fort Bidwell, Calif. A hydraulic ram including a drive pipe having an open upper end and adapted to form a hydrostatic motive column, a valve-controlled air chamber communicating with said drive pipe, an ascension pipe rising from the air chamber, an impetus valve controlling the intermittent discharge of said drive pipe beyond the air chamber and adapted to be closed by the flow of the motive column, said valve opening upwardly, and spring actuated means to positively lift said valve, said lift means being subject to a cessation of flow of the motive column; together with a well casing adapted to be installed between upper and lower subterranean water stratums, said casing having its upper end closed and from which closed end said drive pipe is suspended and through which the ascension pipe extends, said lift means being arranged above the well casing.

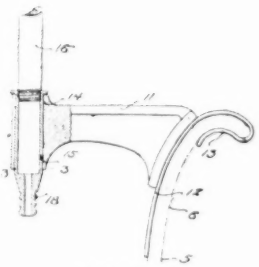
1,383,180. Secondary Valve. Walter B. Woore, New York, N. Y. In a device of the class described, the combination of a conduit having two longitudinally spaced apart apertured partitions in the bore thereof, one of said partitions provided with a valve seat, and facing the other partition and facing in a direction opposite to the direction of flow through the conduit, a floating secondary valvular device including a valve element adapted to be moved by the pressure of the flow on to said seat to intercept the flow through the conduit, and extensions for guiding the valve element to and from its seat, said extensions projecting longitudinally from opposite sides of the valve element and slidably mounted in and extending through the apertures in said partitions and a second conduit inserted in the first-named conduit and adapted to engage the adjacent extension

to hold the valve element in spaced relation to its seat and thus permit a flow past the seat, both of said extensions provided with openings for permitting the flow to pass through the same.

1,383,231. Faucet. Carl A. Nelson, Moline, Ill. In a device of the class described, a casing provided with a plurality of inlet ports and an outlet port, a valve member having a port therein proportioned to communicate with all of the ports at one time and to vary the relative proportion of fluid admitted through the inlet ports, an indicating device having a fixed relation to the valve member and the port thereof, and means co-operating with the indicating device and including yoke elements constructed to fit the casing in a predetermined position with reference to the ports thereof, whereby the relative position of the valve port and the remaining ports is controlled.



1,383,886.



1,383,987.

1,383,886. Water Silencer. Jean F. Webb, Sr., New York, N. Y. As a new article, a water silencer, comprising a tubular member having means, at one end, for connecting it, fluid tight, to a faucet outlet, the outlet end of the tubular member being shaped to direct the outflow at an angle to the direction of the inflow thereto, the said tubular member having integral internal barriers for retarding the direct flow and force of the water therethrough.

1,383,987. Shower Bath Device. Gennaro De Bellis, Philadelphia, Pa. A shower device of the character described including a supported arm having an upright hole; and an upright shower pipe including a portion adapted to freely slide downwardly into said hole, said hole and portion of the pipe having parts adapted to prevent rotation therebetween, said pipe having a hose connecting nipple whereby a hose can be connected to said nipple and to a faucet, and the nipple and pipe can be freely lifted upwardly out of said hole when it is desired to detach the pipe from the bracket, said pipe having a part for limiting the downward movement of said portion of the pipe in said hole; substantially as described.

Heating Department.

1,383,680. Metallic Pipe Covering. John A. Waldorf, Salt Lake City, Utah. A pipe covering composed of semi-tubular metal sections containing hermetically sealed air spaces,

1,383,680.

spacers to center said sections with reference to the pipe covered, and semi-tubular telescope joints to connect said sections at places requiring odd lengths of section.

SAACO

You have, no doubt, seen our advertisements in previous issues covering various specialties. We trust you will not overlook SAACO brand Soil Pipe and Fittings made at our Linfield plant.

Our goods are right. Service and prices must be right.

Sanitary Company of America
LINFIELD, PA.

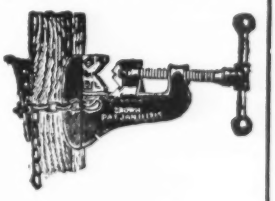
CROWN

Post Pipe Vise
Holds Tight and Firm Anywhere

Can be attached to any wood or iron, round or square post, pole or tree.

Jaws of best tool steel, hardened and drawn. Will not crush or allow pipe to slip. Made in two sizes.

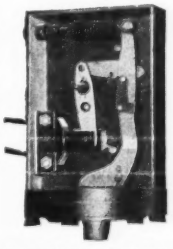
Write for particulars and catalog.



Ask your jobber for "Crown" Post Vises, Pipe Dies, Pipe Cutters, Etc.

CROWN DIE & TOOL CO., 555 W. Monroe St., Chicago

Type "R" Penn Pressure Switch



When you are called to repair an automatic electric pump, nine times out of ten the fault is with the switch.

This does not happen where pumps are equipped with the

Type "R" Penn Pressure Switch

After the most rigid tests and actual service, Penn Switches have been adopted by the leading pump makers of the country.

Plumbers who install Penn equipped pumps may be sure of good service and lasting satisfaction.

Manufactured by

PENN ELECTRIC MACHINE CO.
114 Eighth Street :: DES MOINES, IOWA

Gerstein
Cistern and Riveted Pressure Boilers
can be described in one word—

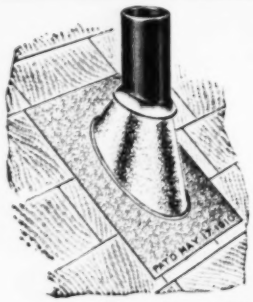
Everlasting

They not only *last* but give continuous satisfactory service.

Made in any size, pressure or capacity desired.

Write for details.

Gerstein Bros. & Cooper
Coppersmiths
[illegible] W. Third Street So. Boston, Mass.



Don't Be Content

With Ordinary Roof Flashings

Specify and Use the Reliable

"SIMPLEX"

Made in

All Lead—Copper—Galvanized Iron

Every Flashing Adjustable
Every Flashing Perfect

Manufactured only by

Simplex Mfg. Company

313 S. Clinton St. **Chicago**

Handiest Faucet Made

You can cut your expense of laundry tray installations 15% by using the

Burman "Unit" Laundry Faucet

It does away with pipe and fittings for four faucets—only two valves needed. Eliminates horizontal pipe carriers at back of tray. By a slight movement of spout, water is supplied to either tray. Hot water can be drawn without filling room with steam, by turning on cold valve slightly.

Furnished with hose attachment.

Makes a better looking and more sanitary job.

Write for circulars

Burman Specialty Co., 1908 Lincoln Street, N. E. Minneapolis, Minnesota

ESTABROOK GREASE TRAP

Designed for outside installation for hotels, restaurants and private residences where large quantities of greasy water are used. Prevents clogged drains. Easily cleaned out.

Write for catalog and prices

R. ESTABROOK'S SONS
1st and C Streets
SOUTH BOSTON, MASS.

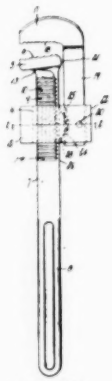
Get your wants into the searchlight of the Classified Columns of

"Domestic Engineering"

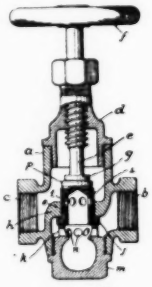
If you are seeking a better position, looking for competent help, want to sell your business, form a partnership, buy or sell second-hand machinery, a *Classified Advertisement* will put you in touch with the right parties.

Try It.

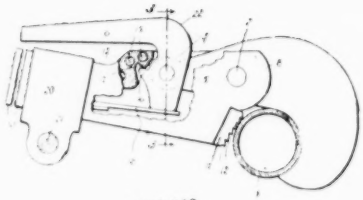
1,383,672. Wrench. Christos A. Stolakiss, Boston, Mass. A wrench having, in combination, a fixed jaw, a shank formed integral with said fixed jaw provided with a beveled surface upon one side thereof, said beveled surface having teeth formed therein, a yoke surrounding said shank and provided with teeth adapted to engage the teeth of said shank, a movable jaw opposed to said fixed jaw, a shank formed integral with said movable jaw pivotally mounted upon said yoke and yielding means interposed between said shanks adapted to force said teeth into engagement with each other and thereby rigidly secure said yoke upon the shank of said fixed jaw.



1,383,672



1,383,005.



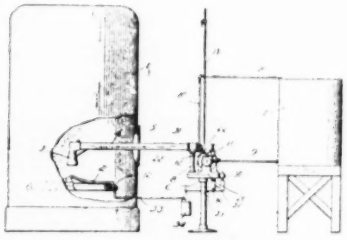
1,382,832.

1,383,005. Steam Valve. Louis R. Mertens, Philadelphia, Pa., assignor to Charles J. Miller, Philadelphia, Pa. A steam valve comprising a valve casing having a bottom opening, an orificed web in the casing, the casing having an inlet port and an outlet port on opposite sides of said web, a hollow valve guide extending through the orifice in the web, a closure for the bottom opening, an orificed neck on the closure adapted to engage said guide and hold it in fixed relation with the web, a hollow perforated valve extending into said guide and adapted to seat thereon, said valve being arranged to be inserted through the bottom opening and the orifice in the web, and a separate stem adapted to be moved in one direction to seat the valve and the opposite direction to allow steam pressure, admitted through said neck into the interior of the valve, to unseat it.

1,382,832. Pipe Tongs. Richard D. Hill, Fort Worth, Tex., assignor to P. Q. Krohn, Electra, Tex. Pipe tongs comprising a relatively movable jaw provided with a recess to conformably receive a drill stem coupling or pipe, a smaller stationary jaw provided with teeth, cheek pieces on each side of the jaws, and a lever pivoted to the inner end of the larger jaw and to the cheek pieces, said movable jaw also pivoted approximately midway of its ends to the cheek pieces, means adjacent the lever, whereby when the lever is moved away from or toward the tongs the movable jaw will be moved away from or toward the smaller jaw, and means for locking the lever in operative position when the lever is released.

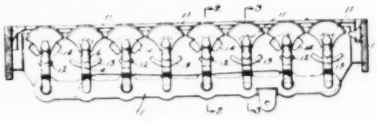
1,382,223. Oil Burning Apparatus and Method. William H. Pascoe, Chicago, Ill. A liquid fuel apparatus adapted to be permanently associated with a furnace and comprising means located outside of the furnace for automatically mixing liquid fuel and air, means located within the furnace for burning the

fuel mixture, and a conduit of substantial length carrying the fuel mixture from the mixing means to the burner, said conduit being of sufficient length to substantially prevent the radiation or conduction of heat from the burner to the mixing means.



1,382,223.

1,382,998. Grate Bar and Support Therefor. Edward B. McConnell, Newark, N. J. In a grate, a series of identical grate bars having high and low trunnions, and means for



1,382,998.

selectively supporting said bars on either their high or low trunnions.

Coal and Oil as Fuel.

Mr. David Brownlie, in a recent computation of the relative efficiency of coal and oil as fuel, takes as a reasonable and fair comparison under moderately good attention 80 per cent efficiency for oil and 72½ per cent efficiency for coal. This gives one ton of oil at 18,000 B. t. u. and 80 per cent efficiency costing £6, as against one ton of coal at 12,000 B. t. u. and 72½ per cent efficiency costing £2 per ton.

Mr. Brownlie's elementary deductions are, therefore, that one ton of oil is equal in net heating value to 1.65 tons of coal, and to produce the same amount of steam as from one ton of oil at £6 it would cost £3.30 if coal were used. In other words, if a manufacturer were spending £10,000 a year on coal for his boiler plant, oil would cost him £18,000 a year. Therefore, for most boiler plants the only result of oil firing would be a heavy loss.

In the opinion of some of the foremost students of the subject, the future power supply of the world depends not on oil, but on water, and the outstanding development of power supply will take the form of utilization of rivers, streams, and, possibly, the ocean tides.

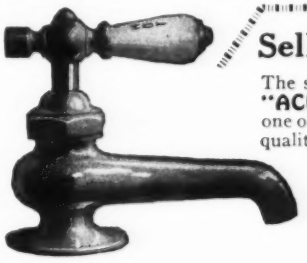
Late News from Jacksonville, Florida.

The ice water fountain, profered to the city by Dr. Payne, a former citizen, will be accepted by the City Commission. The fund provides $50 for the erection of the fountain and $2,500 to be invested in bonds, the interest from which to be used in icing the fountain. It is to be placed in Hemming Park.

The five City Commissioners of Jacksonville have been given certain departments to look after. Frank Owens has the building department under his supervision. Chas. M. Chapman, master plumber, was re-elected to serve on the plumbers' examining board, and F. W. Murray elected to fill the vacancy in the journeyman division. Mr. Owens is chairman of the Board of City Commissioners and of the Examining Board.

When a problem troubles you, ask "Domestic Engineering."

INBRACO
BALL COCKS
FLUSH VALVES
TANK TRIMMINGS
THE INDIANA BRASS CO.
FRANKFORT, INDIANA



Sells on Its Merit
The splendid appearance of the "ACME" Basin Cock is only one of its good features. It has quality all the way through.
Opens and closes fully on quarter turn of handle.
Sells at the right price, too.
Ask your jobber for the ACME". *If he hasn't it in stock, write us, giving his name.*
Acme Brass Works, Detroit, Mich.
We also make a line of Boiler Drain Cocks and Sill Cocks
New York Office, 150 Nassau St. George B. Muller, Eastern Sales Mgr.

"EVER-HOT"
SOLDERING IRON AND TORCH

No. 4 $1.25
No. 3 $1.00
No. 6 $1.50
No. 1 $1.00
No. 2 $1.50

Handiest tool ever devised for the plumber and steam fitter. Operates perfectly under all conditions. It does the work of both a Soldering Iron and Blow Torch—is light, compact and easily handled.
The workman who has used the EVER-HOT is never satisfied with old methods again. Price, including No. 1 Tip, $11. Extra Tips furnished at prices given.
We have a special metal guaranteed to solder all metals. Largely used for cast iron water jackets, etc. Price, $4 per lb.
If your jobber cannot supply you, write us direct.
The Everhot Mfg. Co. Dept. D Maywood, Ill.

NO ROOF IS SUPERIOR TO ITS FLANGE

Therefore, some PLUMBER is the father of every leaky roof.
The Bullard Roof Flange
is acknowledged as the only PERFECT FLANGE by busy men who have made satisfying installations.
THE BULLARD SPECIALTY COMPANY, Tiffin, O.

Classified Advertisements

8 cents for each word including heading and address. Count seven words for keyed address. Minimum $2.00. One inch $4.00. Cash must accompany order. Copy should reach us Tuesday morning.

Situations Open

SALESMEN WANTED—WE ARE INcreasing our selling force in the South, Middle West and East, and invite applications from salesmen experienced in selling plumbers' brass goods. The Victor Brass Mfg. Co., Cleveland, O. 7-30

WANTED—SALESMEN NOW CALLING on the plumbing trade to sell a high grade staple as a side line. Low price; has merits. Territorial rights granted. Address 356, care "Domestic Engineering," Chicago. 7-30/8-6

SALESMAN—WE REQUIRE THE SERvices of a real plumbing goods salesman for Central New York, with headquarters at Syracuse. **Must be** experienced in the sale of Plumbing Material and have wide acquaintance with the trade in territory mentioned. To the right man we can offer a permanent position and good salary. Give details and references first letter. Woodward-Wagner Co., 1106-10 Spring Garden St., Philadelphia, Pa. 7-30

WANTED—TWO YOUNG MEN TO SELL a line of plumbing specialties. Selling experience not absolutely necessary. Good future for the man who is willing to work for it. Address Box 354, "Domestic Engineering," Chicago. 7-23-8-6

WANTED—SALESMAN NOW CALLING on the plumbing trade to take a high grade standard article as a side line. Not a specialty. No matter what you're selling, our goods will more than pay your expenses. We have several travelers selling our goods exclusively, but desire to open new territory. Correspondence confidential. Plant located in Michigan. Address 336, "Domestic Engineering," Chicago. 6-11-tf

SALES REPRESENTATIVES WANTED—Able and active sales representatives wanted throughout the States to handle a line of pneumatic pressure systems, deep well, condensation and centrifugal pumping machinery. Company established many years has complete manufacturing plant and many thousands of pumps in operation. An excellent opportunity for a number of capable representatives. Address 345, "Domestic Engineering," Chicago. 6-18 tf

For Sale

FOR SALE—S-468 AMERICAN SECtional Boiler, used one season. A-1 condition. Safety valve included. Also 36x72 vertical boiler in good repair. W. E. Jameson, Fulton, Mo. 7-30

Situations Wanted

POSITION WANTED—BY A-1 PLUMBer and steam fitter. Twenty years' experience. Best reference. State wages. West preferred. Can handle big jobs. P. O. Box 235 Galesburg, Ill. 7-30

Miscellaneous

PARTNER WANTED — RELIABLE plumber and steamfitter with $1,500 to $2,000 to invest in business. Good reference required. Address 355, care "Domestic Engineering," Chicago. 7-30

TIME SHEETS, JOB TICKETS, ESTImating blanks, etc., for plumbers. Small or large lots. Reasonable. Samples and prices free. Prompt service. Louis Fink & Sons, Inc., Laurel Springs, N. J. 7-30 tf

WE HAVE A GOOD MARKET FOR your excess couplings. Republic Pipe & Iron Corp., 1185 Flushing Ave., Brooklyn, N. Y. 10-9 tf

SELL YOUR SURPLUS COUPLINGS and fittings. Write us. The A. & J. Mfg. Co., 557 W. Lake St., Chicago. tf

1 1/2 x 3/4
RED. ELLS
Send for free Booklet "How to Systematize the Stock Room and Build Bin Racks."

BIN LABELS
For water, gas, steam, plumbing, mill and auto supplies. Over 10,000 different kinds. Send for samples.
Haddon Bin Label Co.
Haddon Heights, N. J.

Are there 5 and 10 cent pieces lying around your shop in the form of PIPE COUPLINGS? If so, pick them up and advise us amount of your accumulation.

JOHN W. MOON

1420 Chestnut St. Philadelphia, Pa.

Government Proposals

Treasury Department, Supervising Architect's Office, Washington, D. C., July 19, 1921.—Sealed proposals will be opened in this office at 3 p. m., August 16, 1921, for renewing water piping, etc., in the United States Post Office, Scranton, Pa., in accordance with specification, copies of which may be had at this office or at the office of the Custodian, Scranton, Pa., in the discretion of the Supervising Architect. Jas. A. Wetmore, Acting Supervising Architect. 7-23-30

Treasury Department, Supervising Architect's Office, Washington, D. C., July 11, 1921.—Sealed proposals will be opened in this office at 3 p. m., Aug. 8, 1921, for a new toilet room in the United States Post Office, La Fayette, La., in accordance with specification and drawing, copies of which may be had at this office or at the office of the Custodian, La Fayette, La., in the discretion of the Supervising Architect. Jas. A. Wetmore, Acting Supervising Architect. 7-23/30

Books for Your Trade Library.

SANITATION IN THE MODERN HOME. By John K. Allen. Explains the proper arrangement and equipment of bath room, laundry, kitchen, etc. A suitable book to present to your customer or prospective one. Size 5½x8 in. 272 pages. Cloth. Price, $2.00.

JOHNSON'S HANDY MANUAL. By John W. Johnson. The author is a practical plumbing and heating man, having spent many years in workshops and has superintended the installation of plumbing and heating systems of all descriptions. Eight editions of this popular book have been exhausted. The ninth is just off the press. Size 4x6¾ in. 398 pages. Cloth. Price, $1.75.

NOTES ON HEATING AND VENTILATION. By Prof. John R. Allen. A text book on the known methods of heating and ventilaton, covering warm air, steam, hot water and vapor, and approved methods of ventilation. Among the subjects covered are rules for figuring heat loss, direct and indirect systems, warm air furnaces, fan blast and air-mixing systems, auxiliary devices for heat control. Illustrations are especially numerous and well made. Size 6x9 in. 228 pages. Cloth Price, $2.50.

Domestic Engineering
407 S. Dearborn St., Chicago

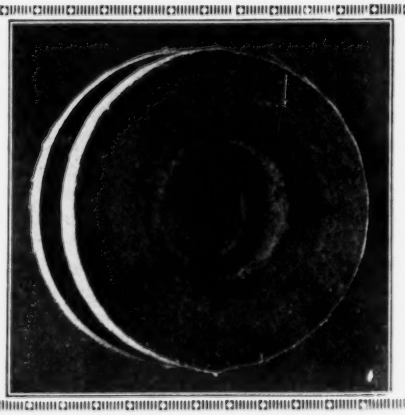
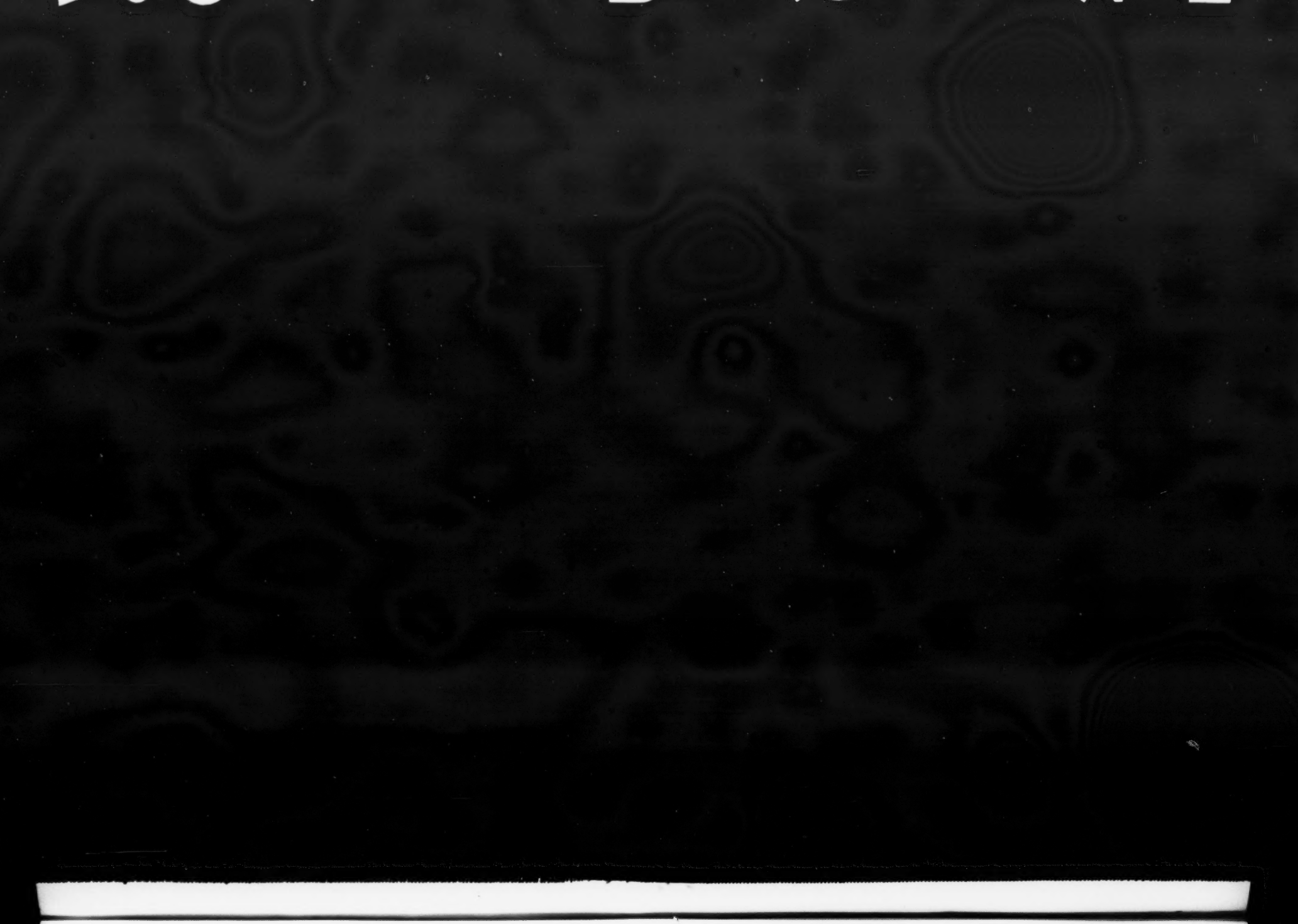
For Your High Class Hot Water Work Use

"DIAMOND N" FELT COVERING

It is made of best materials throughout, in any thickness desired. Body of superior wool felt. Lined inside with our own asbestos paper. Recognized by prominent heating men as the best non-conductor for all low temperature heating work.

Where the highest standard of quality is essential and price secondary consideration, "Diamond N" Felt Covering is used.

Write for prices and details.

Norristown Magnesia & Asbestos Co.

Norristown, Pa.